

TOTAL  
ACOUSTICS™

# METALWORKS™

3D / Mesh™ / Tegular / Tin



TO  
ACOUSTICS™

# WOODV™

Grille Tegular / Chan

Raise a glass to the diversity of ceiling design options that combine  
Learn about the benefits of Total Acoustics™ performance featuring total



TOTAL  
ACOUSTICS™

WORKS®

Perforated Tegular / Tegular



TOTAL  
ACOUSTICS™

MINERAL FIBER

Calla® / Ultima® / Ultima® Health Zone™ / Fine Fissured™  
School Zone® / Cirrus® / Canyon® / Mesa™ / Georgian™

both sound absorption (NRC) and sound blocking (CAC) in one system.  
noise control and design flexibility at [armstrongceilings.com/totalacoustics](http://armstrongceilings.com/totalacoustics).



- CELEBRATING 125 YEARS OF ARCHITECTURAL RECORD -

# POP THE CORKS

WE'VE GOT THE  
NOISE COVERED



Inspiring Great Spaces®

**Armstrong**®  
CEILING SOLUTIONS

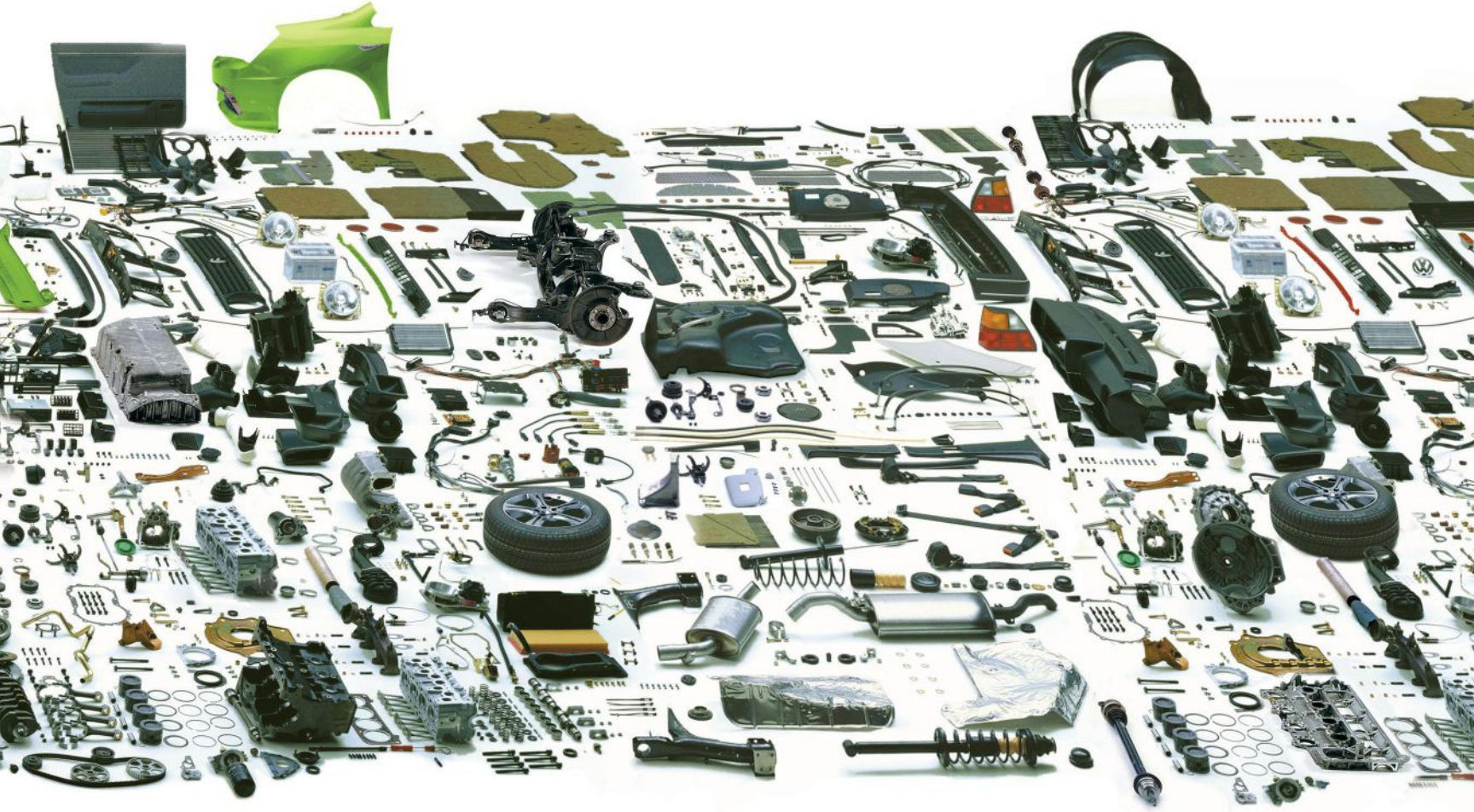
# Still buying **building**



**Only one company can provide fully-integrated building envelopes.**

An automobile is a complex machine made up of thousands of parts. You would never order an automobile one part at a time, so why specify a building envelope that way? We are the only manufacturer that designs, engineers, tests and manufactures curtain wall, windows, storefronts, skylights and glass seamlessly from one source. So let's build better, faster, with less risk, more reward—we're The Building Envelope Company.™ Call 1-866-Oldcastle (653-2278) or visit [obe.com](http://obe.com).

# envelopes this way?



**Oldcastle BuildingEnvelope®**

*Engineering your creativity™*

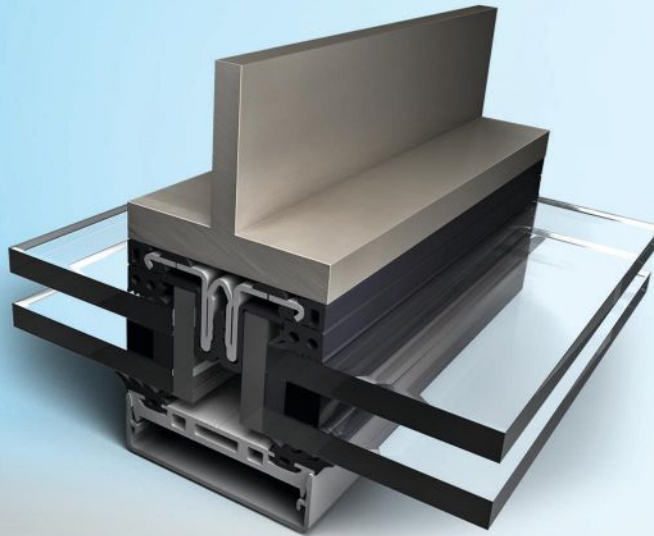
curtain wall | storefronts | windows | skylights | glass



We congratulate  
Architectural Record for  
**125** Years  
of outstanding service  
to the Architectural  
Community.







# BEUNBENDING

BECAUSE SLEEK IS STRONG.

The SteelBuilt Curtainwall Infinity™ System from Technical Glass Products is approximately three times stronger than traditional aluminum curtain wall assemblies. This opens architects and designers to a variety of creative solutions, because only steel can support the growing demand for huge glass sizes and larger spans.

The innovative system can incorporate nearly any type of custom steel member as a back mullion – such as stainless steel, box, I-beams and T-shapes. The infinite design flexibility of steel frames allows you to “go big” to achieve your desired aesthetic.

Ready to broaden your perspective? Check out

[tgpamerica.com/infinity](http://tgpamerica.com/infinity)

[tgpamerica.com](http://tgpamerica.com) | 800.426.0279

**STEELBUILT**  
CURTAINWALL INFINITY™ SYSTEM



**ARCHITECTURAL**  
one source. many solutions.®



Clearly Evolving





**Introducing the latest evolution in low-e glass.**

Architects strive for continuous improvement—in fact, you might say it's in their DNA. Developed with guidance from architects and featuring proprietary technology by PPG, *Solarban*® 90 glass provides the superior solar control performance and optimal occupant comfort architects have always wanted with the aesthetics of clear glass.

**For a sample, call 1-888-PPG-IDEA or visit [ppgideascpes.com/sb90](http://ppgideascpes.com/sb90).**

Solarban, IdeaScapes, PPG and the PPG logo are trademarks of PPG Industries Ohio, Inc.

**CIRCLE 75**





## RIEDER

### **Hang concrete on curtain wall**

- | 16,000 sqf formparts with only 1/2" thickness
- | Less sub-construction due to weight and span width of formparts
- | Offsite pre-assembly of fastening brackets
- | Onsite fast and unitised installation, easy to hook in

Distributed by fibreC North America

1-877-740-0303 (toll free) | [usa@fibreC.com](mailto:usa@fibreC.com) | [www.fibreC.us](http://www.fibreC.us)



ULTRA  
LIGHT  
FOLDED  
CONCRETE



Boston University, Center for Integrated Life Sciences & Engineering  
Payette | Turner | Ipswich Bay Glass

**CIRCLE 134**



Architect: Pei Cobb Freed & Partners



# Curve Appeal

With its innovative conical indentations, the luminous stainless steel and glass curtain wall of **Pei Cobb Freed & Partners' 7 Bryant Park** becomes an extension of the city's green space. From inside, occupants have a bird's-eye view of surrounding park, while outside, passersby appreciate its reflections. Terminating in a floating canopy sheltering a new plaza—the curved motif successfully underscores this private building's public gesture to the neighborhood around it. Read more about it in **Metals in Construction** online.

 **Ornamental Metal Institute of New York**

WWW.OMINY.ORG

CIRCLE 12

## ARCHITECTURAL RECORD

<b>EDITOR IN CHIEF</b>	Cathleen McGuigan, <a href="mailto:mcguiganc@bnpmedia.com">mcguiganc@bnpmedia.com</a>
<b>MANAGING EDITOR</b>	Beth Broome, <a href="mailto:broomeb@bnpmedia.com">broomeb@bnpmedia.com</a>
<b>DEPUTY EDITOR</b>	Suzanne Stephens, <a href="mailto:stephenss@bnpmedia.com">stephenss@bnpmedia.com</a>
<b>FEATURES EDITOR</b>	Josephine Minutillo, <a href="mailto:minutilloj@bnpmedia.com">minutilloj@bnpmedia.com</a>
<b>SENIOR EDITORS</b>	Joann Gonchar, AIA, LEED AP, <a href="mailto:goncharj@bnpmedia.com">goncharj@bnpmedia.com</a> Linda C. Lentz, <a href="mailto:lentzl@bnpmedia.com">lentzl@bnpmedia.com</a>
<b>PRODUCTS EDITOR</b>	Julie Taraska, <a href="mailto:taraskaj@bnpmedia.com">taraskaj@bnpmedia.com</a>
<b>NEWS EDITOR</b>	Anna Fixsen, <a href="mailto:fixsena@bnpmedia.com">fixsena@bnpmedia.com</a>
<b>WEB EDITOR</b>	Miriam Sitz, <a href="mailto:sitzm@bnpmedia.com">sitzm@bnpmedia.com</a>
<b>ASSISTANT EDITOR</b>	Alex Klimoski, <a href="mailto:klimoskia@bnpmedia.com">klimoskia@bnpmedia.com</a>
<b>EDITORIAL ASSISTANTS</b>	Sam Furnival, Jake Bittle
<b>COPY EDITOR</b>	Anna Shapiro
<b>ART DIRECTOR</b>	Michael T. Powell, <a href="mailto:powellm@bnpmedia.com">powellm@bnpmedia.com</a>
<b>ASSISTANT ART DIRECTOR</b>	Kaylee Foster, <a href="mailto:fosterk@bnpmedia.com">fosterk@bnpmedia.com</a>
<b>CONTRIBUTING ILLUSTRATOR, PRESENTATION DRAWINGS</b>	Peter Coe
<b>CONTRIBUTING EDITORS</b>	Sarah Amelar, Fred A. Bernstein, Robert Campbell, FAIA, C.J. Hughes, Blair Kamin, Jayne Merkel, Clifford A. Pearson, David Sokol, Michael Sorkin, Sarah Williams Goldhagen
<b>SPECIAL INTERNATIONAL CORRESPONDENT</b>	Naomi R. Pollock, AIA
<b>INTERNATIONAL CORRESPONDENTS</b>	David Cohn, Tracy Metz, Aric Chen, Chris Foges
<b>CONTRIBUTING PHOTOGRAPHERS</b>	Iwan Baan, Roland Halbe

**ARCHITECTURAL RECORD** (ISSN: Print 0003-858X Digital 2470-1513) September 2016, Vol. 204 No. 9. Record is published 12 times annually, monthly by BNP Media II, LLC., 2401 W. Big Beaver Rd., Suite 700, Troy, MI 48084-3333. Telephone: (248) 362-3700, Fax: (248) 362-0317.

**ANNUAL RATE FOR PRINT, DIGITAL AND COMBO SUBSCRIPTIONS TO INDIVIDUALS IN THE U.S.A.:** Print \$72.00, Digital \$18.00 and Print Digital Combo \$81.00. Annual rate for subscriptions to individuals in Canada: Print \$129.00, Digital \$18.00 and Print Digital Combo \$138.00 (includes GST & postage); Annual rate for individuals outside of U.S.A.: Print \$199.00, Digital \$18.00 and Print & Digital Combo \$208.00. Payable in U.S. funds. All rates are in USD. Single Copy sales \$9.95; Foreign \$11.00.

Printed in the U.S.A. Copyright 2016, by BNP Media. All rights reserved. The contents of this publication may not be reproduced in whole or in part without the consent of the publisher. The publisher is not responsible for product claims and representations.

Periodicals Postage Paid at Troy, MI and at additional mailing offices.

**FOR SINGLE COPY SALES OR BACK ISSUES ONLY:** contact Ann Kalb at (248) 244-6499 or [KalbR@bnpmedia.com](mailto:KalbR@bnpmedia.com).

**POSTMASTER:** Send address changes to: ARCHITECTURAL RECORD, P.O. Box 16387 North Hollywood, CA 91615.

**CANADA POST:** Publications Mail Agreement #40612608. GST account: 131263923. Send returns (Canada) to IMEX Global Solutions, P.O. Box 25542, London, ON N6C 6B2.

**CHANGE OF ADDRESS:** Send old address label along with new address to ARCHITECTURAL RECORD, P.O. Box 16387 North Hollywood, CA 91615.

**FOR SUBSCRIPTION INFORMATION OR SERVICE, PLEASE CONTACT CUSTOMER SERVICE AT:**  
Phone: 877-876-8093 (USA only) or 818-487-2077 (outside USA).

**EDITORIAL OFFICES:** 646/849-7124. 350 Fifth Avenue, Suite 6000, New York, NY 10118. **WEBSITE:** [architecturalrecord.com](http://architecturalrecord.com).




BNP Media Helps People Succeed in  
Business with Superior Information



PRINTED IN USA



Beauty  
made easy.



Show off the natural beauty of wood post and beam connections with **Simpson Strong-Tie® concealed connectors**. Whether you want to expose the framing of an interior space or an outdoor wood structure, our line of concealed connectors makes it easy to customize your project and give your customers a distinct, clean look – without sacrificing structural integrity.

To learn more, call (800) 999-5099 and visit [strongtie.com/concealed](http://strongtie.com/concealed).

**SIMPSON**  
**Strong-Tie**

# METALS IN CONSTRUCTION MAGAZINE 2017 DESIGN CHALLENGE

## Reimagine Structure

Prize: \$15,000

The Architecture 2030 Challenge to reduce energy consumption in buildings isn't just about the energy they consume day to day. It's also about the energy consumed in producing the materials used to construct them. Submit your vision for minimizing this embodied energy by designing a high-performance New York City office tower—one whose envelope is part of its structure.

LEARN MORE AND REGISTER AT  
[www.metalsinconstruction.org](http://www.metalsinconstruction.org)

SPONSORED BY

 **Steel Institute of New York**

# ARCHITECTURAL RECORD

## PUBLISHER

Alex Bachrach  
[bachracha@bnpmedia.com](mailto:bachracha@bnpmedia.com)

## ADVERTISING SALES

**NEW ENGLAND AND PA:** Joseph Sosnowski  
(610) 278-7829, Fax: (610) 278-0936, [sosnowskij@bnpmedia.com](mailto:sosnowskij@bnpmedia.com)  
**SOUTHEAST, MID-ATLANTIC:** Wesley Loon  
(859) 414-3795, Fax: (248) 502-9104, [loonw@bnpmedia.com](mailto:loonw@bnpmedia.com)  
**MIDWEST (IA, IL, MN, MO, WI):** Bruce Smith  
(224) 216-7836, Fax: (248) 786-1390, [Smithb@bnpmedia.com](mailto:Smithb@bnpmedia.com)  
**MIDWEST (IN, MI, OH), TX, OK, EASTERN CANADA:** Lisa Zurick  
(513) 345-8210, Fax: (513) 345-8250, [zurickl@bnpmedia.com](mailto:zurickl@bnpmedia.com)  
**WEST, WESTERN CANADA:** Bill Madden  
(503) 260-9679, Fax: (503) 557-9002, [bill@maddenandassociates.net](mailto:bill@maddenandassociates.net)  
**FL, KS, NE, ND, NY, SD:** Risa Serin  
(212) 904-6041, Fax: (212) 904-4652, [serinr@bnpmedia.com](mailto:serinr@bnpmedia.com)

## WORKFORCE/RECRUITMENT:

Diane Soister  
(646) 849-7137, Fax: (248) 502-2046, [soisterd@bnpmedia.com](mailto:soisterd@bnpmedia.com)

## CONTINUING EDUCATION

### CONTINUING EDUCATION GROUP MANAGER

Brittanie Wilson  
[wilsonb@bnpmedia.com](mailto:wilsonb@bnpmedia.com)

### CONTINUING EDUCATION PROJECT COORDINATOR

Stephanie Costigan  
[costigans@bnpmedia.com](mailto:costigans@bnpmedia.com)

### CUSTOM CONTENT EDITOR

Samantha Meux  
[meuxs@bnpmedia.com](mailto:meuxs@bnpmedia.com)

## CORPORATE DIRECTORS

**PUBLISHING**  
John R. Schrei  
**CORPORATE STRATEGY DIRECTOR**  
Rita M. Foumia  
**INFORMATION TECHNOLOGY**  
Scott Krywko  
**PRODUCTION**  
Vincent M. Miconi  
**FINANCE**  
Lisa L. Paulus  
**CREATIVE**  
Michael T. Powell  
**HUMAN RESOURCES**  
Marlene J. Witthoft  
**EVENTS**  
Scott Wolters  
**CLEAR SEAS RESEARCH**  
Beth A. Surowiec

## AUDIENCE MARKETING

**AUDIENCE MARKETING PROJECT MANAGER**  
Cassandra Kerby  
**CORPORATE INTEGRATED MEDIA MANAGER**  
Megan Neel  
**CORPORATE AUDIENCE AUDIT MANAGER**  
Catherine M. Ronan  
**ONLINE DEVELOPMENT DIRECTOR**  
Nikki Smith  
**DIRECTORY DEVELOPMENT MANAGER**  
Erin Mygal

## LIST RENTALS

**SENIOR ACCOUNT MANAGER**  
Kevin Collopy  
(402) 836-6265,  
[kevin.collopy@infogroup.com](mailto:kevin.collopy@infogroup.com)  
**SENIOR ACCOUNT MANAGER**  
Michael Costantino  
(402) 836-6266,  
[michael.costantino@infogroup.com](mailto:michael.costantino@infogroup.com)

BNP MEDIA: (248) 244-6400

WEBSITE: [architecturalrecord.com](http://architecturalrecord.com). SUBSCRIBER SERVICE: 877/876-8093 (U.S. only); 818/487-2077 (outside the U.S.). Subscriber fax: 712/755-7423. E-mail: [AR@pubservice.com](mailto:AR@pubservice.com). If the Post Office alerts us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within one year. **INQUIRIES AND SUBMISSIONS:** Letters, Beth Broome; Practice, Suzanne Stephens; Books, Suzanne Stephens; Lighting and Interiors, Linda C. Lentz; Architectural Technology, Joann Gonchar; News, Anna Fixsen. **REPRINTS:** [architecturalrecord@theygsgroup.com](http://architecturalrecord@theygsgroup.com).



BNP Media Helps People Succeed in  
Business with Superior Information





# Agave Series

LANDSCAPE CONTAINERS

Renowned design, fine craftsmanship, enduring material

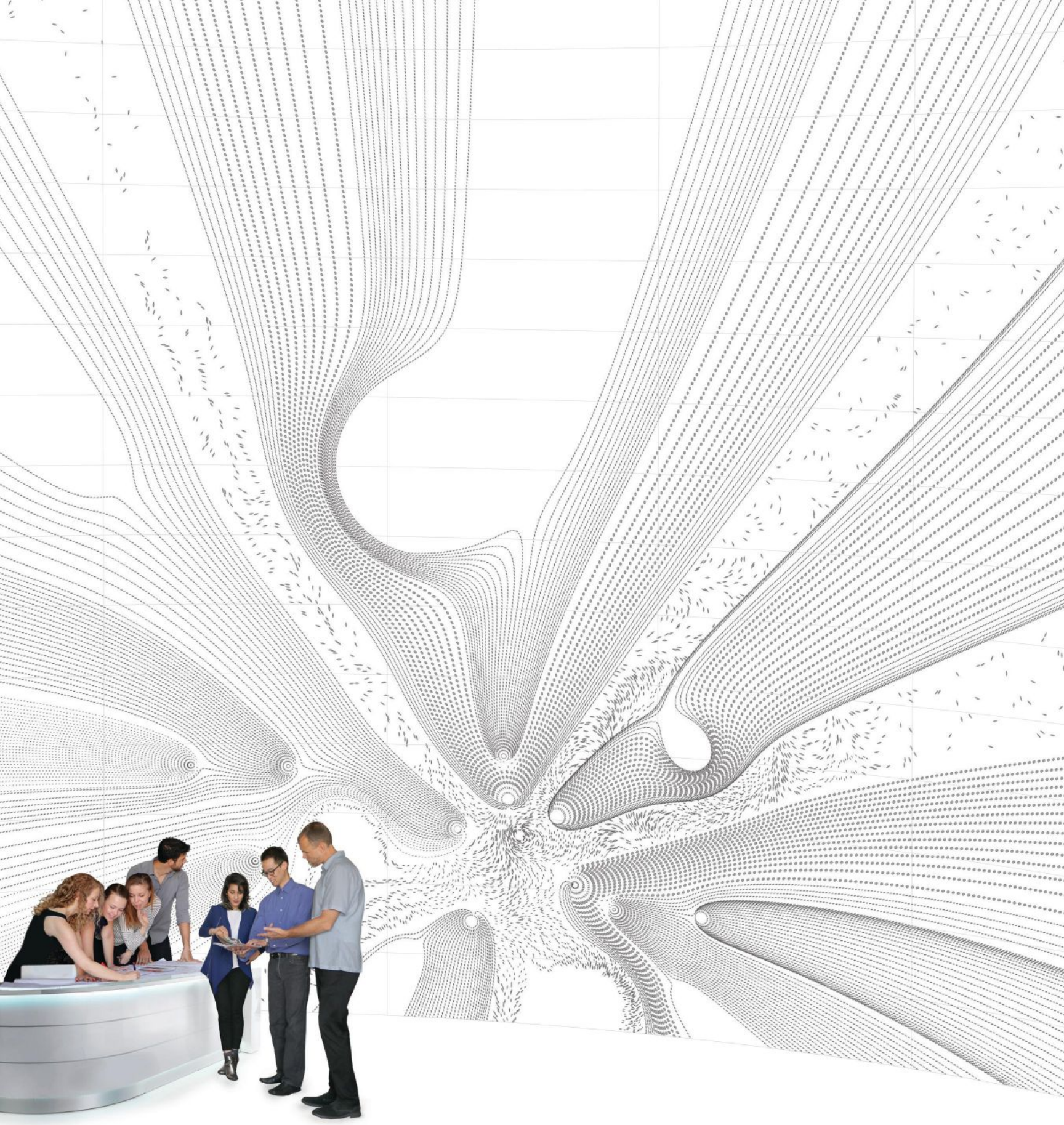


3 sizes available  
High-strength, 6000+ PSI concrete  
Endless color options



KORNEGAY DESIGN®

KornegayDesign.com | toll free 877.252.6323



**PARTI** delivers design innovation by combining parametric modeling  
with advanced manufacturing solutions  
[www.ceilingplus.com](http://www.ceilingplus.com)



PARTÍ  
by CEILINGS PLUS®

We are ready to take your **BIG** idea and make it an affordable reality

# How do you renovate



# into this?



## ReVyvit by dryvit.

Whether you want to completely change a building's appearance or simply need to improve its energy efficiency, Dryvit has the solution to your renovation challenges. **Contact Dryvit's Renovation Team at 800-556-7752, ext. 9 to learn more or visit [Dryvit.com/revyvit](http://Dryvit.com/revyvit)**



[dryvit.com/tremco](http://dryvit.com/tremco)



# ARCHITECTURAL RECORD <sup>125 years</sup>



# 09 2016

## NEWS

- 27 A NEW SCHOOL FOR SANDY HOOK *By Miriam Sitz*
- 30 EPA ISSUES FINAL RULE ON FORMALDEHYDE EMISSIONS *By Anna Fixsen*
- 31 BARRAGÁN'S REMAINS COMPRESSED INTO DIAMOND *By Miriam Sitz*
- 32 YALE'S BEINECKE LIBRARY RESTORED *By Fred A. Bernstein*
- 35 ARCHITECTURE & DESIGN FILM FESTIVAL PREVIEW *By Anna Fixsen*
- 36 NEWSMAKER: MICHAEL MINER *By Anna Fixsen*

## DEPARTMENTS

- 24 EDITOR'S LETTER: ACROSS THE DECADES WITH ARCHITECTURAL RECORD
- 39 HOUSE OF THE MONTH: OLSON KUNDIG'S MIDCENTURY RESTORATION IN BERKELEY *By Lydia Lee*
- 45 GUESS THE ARCHITECT
- 46 INTERIORS: AIDLIN DARLING DESIGN'S IN SITU RESTAURANT *By Lydia Lee*
- 50 COMMENTARY: PARAMETRICS AND POWER *By Michael Sorkin*

## Celebrating 125 Years

### LOOKING BACK

- 101 INTRODUCTION
- 102 RECORD'S TOP 125 BUILDINGS
- 119 25 CULT CLASSICS
- 124 MY FAVORITE BUILDING
- 128 25 LOST TREASURES *By Robert A.M. Stern*
- 132 A HISTORY OF ARCHITECTURAL CRITICISM IN RECORD *By Suzanne Stephens*

### LOOKING FORWARD

- 139 INTRODUCTION
- 140 VISIONS OF THE FUTURE
- 145 THE ROAD AHEAD FOR DRIVERLESS CARS *By Sarah Amelar*
- 147 MATERIAL FUTURES *By Bradley Quinn*
- 150 ARCHITECTURAL EDUCATION'S CHANGING COURSE *By Jonathan Massey*
- 152 AMERICA'S TOP ARCHITECTURE SCHOOLS 2017 *By Anna Fixsen*

- 53 EXHIBITION: THE PHOTOGRAPHY OF DENISE SCOTT BROWN *By Anna Fixsen*
- 57 FIRM TO WATCH: HOU DE SOUSA *By David Sokol*
- 60 BOOKS: DANIEL M. ABRAMSON'S *OBSOLESCENCE* *Reviewed by Aleksandr Bierig*
- 63 BOOKS: ROBERT A. M. STERN AND JIMMY STAMP'S *PEDAGOGY AND PLACE* AND CATIE MARRON'S *CITY SQUARES* *Reviewed by James Gauer*
- 67 PRODUCTS: RESIDENTIAL *By Julie Taraska*

THIS PAGE: VIA 57 WEST, BY BJARKE INGELS GROUP.  
PHOTO BY IWAN BAAN.

See expanded coverage of Projects and Building Type Studies as well as Web-only features at [architecturalrecord.com](http://architecturalrecord.com).

SEE ONLINE CONTENT PAGE 21.

WE'RE THE COMPLETE PACKAGE.

✕ LARGE FIBERGLASS WINDOWS

✕ FIBERGLASS BALCONY DOORS

✕ ALUMINUM-CLAD WOOD ENTRANCE

WINDOWS • STOREFRONTS • CURTAIN WALLS • ENTRANCES

**Single-Source Solutions for Multifamily Projects. From Pella.**

This mixed-use multifamily complex in Gresham, OR, required a unique solution. So we offered the flexibility of large fiberglass composite windows – providing superior strength with an insulating value similar to wood – along with smooth fiberglass condo unit balcony doors and aluminum-clad wood entrance doors. The result? Retail and multifamily aesthetics that blend seamlessly. Outstanding performance in a rainy climate. And the quality and cost-effectiveness the owner was looking for. Let Pella multiply the possibilities for your next project.



COMMERCIAL  
SOLUTIONS

**CHALLENGE US WITH  
YOUR NEXT PROJECT.**

pecsAR.com • 800.591.7777

# 09 2016

## PROJECT

86 STAVROS NIARCHOS FOUNDATION CULTURAL CENTER, ATHENS RENZO PIANO BUILDING WORKSHOP *By Victoria Newhouse*

## BUILDING TYPE STUDY 974 MULTIFAMILY HOUSING

- 159 INTRODUCTION
- 160 AT HOME IN THE 21ST CENTURY *By John King*
- 162 VIA 57 WEST, NEW YORK BJARKE INGELS GROUP *By Josephine Minutillo*
- 170 CORNER HOUSE, LONDON DSDHA *By Megumi Yamashita*

- 176 BLACKBIRDS, LOS ANGELES BESTOR ARCHITECTURE *By Deborah Snoonian Glenn*
- 182 GREENWICH HOUSING, LONDON BELL PHILIPS ARCHITECTS *By Chris Foges*
- 186 EAST SIDE LOFTS, FRANKFURT 1100 ARCHITECT *By Mary Pepchinski*
- 192 CARMEL PLACE, NEW YORK NARCHITECTS *By Joann Gonchar, AIA*

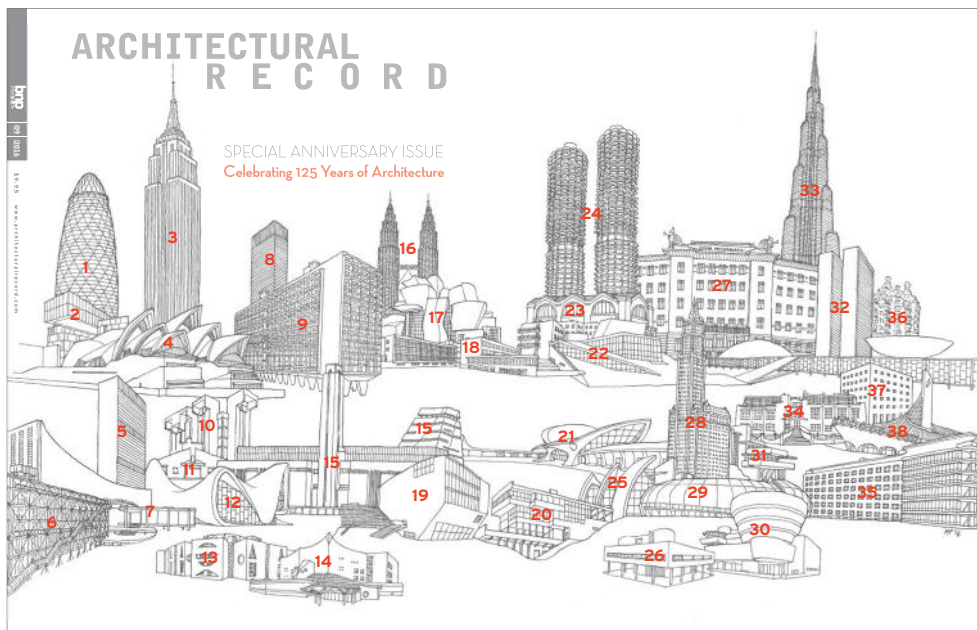
- 257 READER SERVICE
- 265 DATES & EVENTS
- 272 SNAPSHOT: TORRE ARCOBALENO IN MILAN *By Miriam Sitz*

## TECHNOLOGY

209 PUSHING PREFABRICATION: FROM ENTIRE BUILDINGS TO DISCRETE COMPONENTS, THE USE OF OFF-SITE CONSTRUCTION IS EXPANDING ACROSS MULTIPLE BUILDING TYPES. *By Russell Fortmeyer*



## ON THE COVER



## ABOUT THE ARTIST

Matteo Pericoli is an architect, author, illustrator, and teacher. After graduating from the Politecnico of Milan in 1995, he moved to New York, where he worked at Richard Meier & Partners Architects and other firms. In 2010, he founded the Laboratory of Literary Architecture, a cross-disciplinary exploration of literature as architecture. His illustrated books—to name a few—include *Manhattan Unfurled*; *London Unfurled*; *The City Out My Window: 63 Views on New York*; and *Windows on the World: 50 Writers, 50 Views*. Pericoli currently lives in Turin, Italy.

- |                                |  |                              |  |                              |
|--------------------------------|--|------------------------------|--|------------------------------|
| 1. 30 St Mary Axe              | 9. Unité d'Habitation                        | 17. Guggenheim Museum Bilbao | 26. Villa Savoye                         | 34. Glasgow School of Art    |
| 2. Barnes Foundation           | 10. National Center for Atmospheric Research | 18. Bauhaus Building         | 27. Austrian Postal Savings Bank         | 35. Paimio Sanatorium        |
| 3. Empire State Building       | 11. Vanna Venturi House                      | 19. Casa da Musica           | 28. Woolworth Building                   | 36. Casa Milà                |
| 4. Sydney Opera House          | 12. Heydar Aliyev Centre                     | 20. Lovell Health House      | 29. Limoges Concert Hall                 | 37. San Cataldo Cemetery     |
| 5. United Nations Headquarters | 13. National Assembly Building of Bangladesh | 21. TWA Terminal             | 30. Solomon R. Guggenheim Museum         | 38. Yoyogi National Gymnasia |
| 6. Centre Georges Pompidou     | 14. Berlin Philharmonic Concert Hall         | 22. Oslo Opera House         |  |                              |
| 7. Farnsworth House            | 15. Tate Modern I & II                       | 23. Pennsylvania Station     |  |                              |
| 8. Seagram Building            | 16. Petronas Towers                          | 24. Marina City              |  |                              |
|                                |  | 25. Jubilee Church           |  |                              |
|                                |  |                              | 31. Fallingwater                         |                              |
|                                |  |                              | 32. National Congress Building, Brasília |                              |
|                                |  |                              | 33. Burj Khalifa                         |                              |

# IMAGINE HONORING

RACING TRADITION WHILE REINVENTING THE FAN EXPERIENCE

Redesigning the historic Daytona International Speedway® required a solution that would enable design lead Matt Taylor from ROSSETTI to execute a completely paperless design-build project. He also needed to collaborate seamlessly with the management and field teams at Barton Malow Company. Learn how the PDF creation, markup and real-time collaboration features in Bluebeam® Revu® helped all partners during this project communicate quickly and effectively while maintaining complete transparency.

**Imagine the possibilities**

[bluebeam.com/complete](http://bluebeam.com/complete)



bluebeam®  
A NEMETSCHek COMPANY

**Barton  
Malow**



# architecturalrecord.com

VISIT US ONLINE FOR EXPANDED SLIDE SHOWS, PRODUCT SPECIFICATIONS, AND MORE.



THE RAINBOW TOWER, AS SEEN FROM ABOVE.

## ARCHITECTURAL RECORD 125 years

### EDITOR'S LETTER VIDEO

Watch a conversation about RECORD's past between editor in chief Cathleen McGuigan and former editors Mildred Schmertz and Robert Ivy.

### UP CLOSE WITH THE COVER

Take a closer look at this month's panoramic cover, illustrated by Matteo Pericoli.

### WORST BUILDINGS

Last month, nearly 100 readers submitted their nominations for the worst buildings of the last 125 years. Now, click through the gallery to see some of them.

### READERS RESPOND

Do you agree with our lists of the Best Buildings and Cult Classics? Let us know what you think in the comments section at the bottom of every article!



MILDRED SCHMERTZ, ROBERT IVY, AND CATHLEEN MCGUIGAN.

## HIGHLIGHTS

### SCENES FROM THE NEWS

See more images of the new Sandy Hook School, in addition to an expanded gallery of Denise Scott Brown's photography from the Venice Architecture Biennale exhibition *Wayward Eye*. [NEWS]

### RAINBOW TOWER DRONE FOOTAGE

Get a bird's-eye view of the Torre Arcobaleno in Milan with this drone-filmed video showing the tower's urban context. [SNAPSHOT]

### MICRO-UNIT MOVIE

After reading this month's story on Carmel Place, watch a video of the architects explaining the design of the building as well as the fabrication and installation of its micro-unit apartments. [BUILDING TYPE STUDY]

### FEATURED HOUSES

Find photos, credits, and specifications for new residential projects in this monthly online-only feature. [HOUSES]



THE NEW SANDY HOOK SCHOOL IN NEWTOWN, CONNECTICUT, BY SVIGALS + PARTNERS.



SUBSCRIBE TO  
ARCHITECTURAL RECORD  
TABLET EDITION.  
DOWNLOAD THE APP  
FROM ITUNES.



Follow us on Twitter at @ArchRecord



Like us on Facebook.com/ArchitecturalRecord



Join our LinkedIn group



Follow us on Instagram at @ArchRecordMag

{ then & }  
NOW }  
FINISHING COLLECTIONS™



METRIE™

THE ART OF FORM

VIEW ALL FIVE THEN & NOW FINISHING COLLECTIONS™ | [METRIE.COM/FFAR](https://www.metrie.com/ffar)

---

# EFFORTLESS HARMONY

---

Metrie professionally designed and coordinated interior trim and doors take the guesswork out of selecting interior finishings. Choose from five distinctive collections that are modern interpretations of classic architectural styles to accommodate today's most sought after ambiances. The result is a space that speaks volumes.

## Across the Decades With Architectural Record

A trio of editors discuss the changing world as reflected in the magazine's pages.

To mark *RECORD*'s 125th anniversary, the two living former editors in chief joined me for a conversation about *RECORD*'s past and present. Mildred Schmertz, FAIA, who has an MFA from Yale in graphic design as well as an architecture degree, came to the magazine's art department in 1957, moved on to be a writer and editor and finally was made the first woman editor in chief, from 1985 to 1990. The late Stephen Kliment succeeded her, and then Robert Ivy, FAIA, arrived as the top editor in 1996. When he left to become CEO of the American Institute of Architects in 2011, I was hired to take the helm. Following are highlights from our talk about the magazine's history under our collective watch, which stretches back 59 years.

**Cathleen McGuigan:** Mildred, you were at *RECORD* for 33 years and have the longest view of the magazine. What was its mission when you began, and how did you see it shift from the late 1950s to 1990?

**Mildred Schmertz:** The mission has been the same for 125 years, and it's simple: to serve architects in the profession, to keep their loyalty, and to attract advertisers because of the size and quality of our readership.

**Robert Ivy:** I agree the fundamental mission really hasn't changed. I would just add to that: we inform and inspire our audience; architecture is both an art and a science. But the world has shifted and changed dramatically over the period of time that Mildred and I and you have been involved—everything from the explosion of digital technology to globalization, climate concerns, and social questions. We've all responded in one way or another to all of that through the publication.

**CM:** When I got here, there was no question that this was a publication of tremendous authority. But we also very consciously tried to frame the issues that affect architecture that Robert just mentioned. We have kept our eye on cities, and have been covering other topics the profession is confronting, such as diversity and the collaborative, interdisciplinary world that architects now work in. Yet we're doing all this in the context of presenting the best projects that reflect our time. That's still the core of our mission.

**RI:** We have always had a curatorial role—making selections of projects that we think are going to interest people for a variety of reasons. The good examples are ultimately more interesting than the bad. So, what we have typically done is held up the best examples and said, "Look at this."

**MS:** Something that *RECORD* would simply never do, which some other magazines have done, is take a building that is poor or mediocre and boot it around. The building itself isn't that important really, in the culture, and it always seemed to me very crude to make that kind of attack.

**RI:** Unless there's a rationale for doing it. Architects have said for years, "Why isn't my project in *RECORD*? I've done a school, and really, it's



Record editors in chief, from left to right: Robert Ivy, FAIA (1996–2011); Cathleen McGuigan (2011–present); and Mildred Schmertz (1985–90).

good." And the merely good isn't a rationale for publication either. Because all architects should be doing *good* work. So the question is, what is the lesson in it? Does it have a point of view? What can it share beyond meeting the criteria that any project in any community should meet.

**CM:** We look for projects that embody a specific idea, that reflect something new or innovative. We're looking for excellence, but of course that's subjective. It's a group of editors making selections based on what we think is the best work out there.

Let's switch gears, and talk about digital content. Robert, the digital revolution started when you were editor, and it has had a huge impact on us, because it enables us to do daily journalism. It helps us stay on top of key issues. We are seeing stories break and then evolve, and the process complements what we do in the magazine. And yet print is still *very* important to us, and to our audience.

**RI:** What digital has allowed you to do is bring news forward in a way that we could not. Mildred and I had the luxury of time. We were able to choose, make selections for an audience, with the luxury to work those issues out, get the photography, acquire the writer, and do all those things print demands. But on the Web, you're out there daily, with the latest, putting all those things together in a true publication which is now more than a magazine.

**CM:** Let's talk about the shifts in relevant topics over the years. Robert, under your tenure, there was a real response to globalism. With expanding global markets for architects, you began to cover China intensively—you started the quarterly *ARCHITECTURAL RECORD CHINA* in Shanghai in 2005, and during this time there was also a new focus on sustainability.

**RI:** Part of the magazine's role is to try to catch the wave of development and thought. And in the years that I was active, there was this explosion of international travel and knowledge, and architects were finding work in other parts of the world, not just in China.

British architects had a moment of real creativity, and you could've made a whole publication out of Japan alone. As editors, we recognized

that that was something that was relevant to our community, and we would create issues devoted to, in some cases, a country.

In China's case, it was particularly powerful, because we watched the explosion of the whole country as Chinese architects were training in the United States, going back to China and changing creatively what had been a fairly staid design and construction environment. American architects were going over and doing exciting things, including building whole cities from the ground up.

**CM:** Mildred, what were the big issues the magazine confronted in the years that you were here?

**MS:** For a long stretch when I was at *RECORD*, we celebrated modernism. We showed it all the time, and reached as far as we could. The next great change was, of course, the Postmodern movement. And I can say at this point that it was a great joy, because we'd gotten tired of the modern movement, and when I say we, I mean us, editor-writer folks.

## The world has shifted and changed dramatically over the period we've been involved, from the explosion of digital technology to globalization, climate concerns, and social questions.

Some of the Postmodernists did work of great appeal—I mean they drew well. Michael Graves, Charles Moore—they had started to draw in new ways, and instead of scorning traditional architecture, they were looking at it again but incorporating its values in an inventive way. I don't know whether we had any theory; all we knew was that we were going to grab all that we could, because it looked terrific in the magazine.

**CM:** Robert, when you took over, Postmodernism was on the wane, and we'd already had the deconstructivist burst.

**RI:** As I was coming into the role, we saw the convergence of the digital revolution with material prosperity. I was here during a period of unparalleled money. We had a license to build anything the human mind could conceive because we were freed from this orthogonal framework, of what had been the drawing board and became computer-aided design. It was as if someone had thrown a bomb.

And, so, architects were developing computer programs, using software from the aerospace industry. And, all of a sudden, the forms of buildings began to change. Architects were freed, and we had buildings that began to look like a snail or a slug or an exploding flower, or something like that.

For a period of time, buildings were extremely exuberant and defied any sort of label. And that created what came to be known as iconic architecture, from starchitects like Frank Gehry and Zaha Hadid and Santiago Calatrava, where basically architecture became a form of urban sculpture as well as habitation.

And, what evolved somewhat later, were people—young people in particular—asking, why these icons? In publications like ours, which had been purveying them and putting them on our covers—because

they made great covers and subject matter—they kept saying, what about the community?

**CM:** We're still incredibly impressed with spectacularly beautiful, exotic buildings, but a magazine like *RECORD* doesn't have to settle on one point of view. It is really a reflection of all kinds of architecture.

We love the mix and the plurality, and we can celebrate all of that. But it's true that many younger architects seem to have different values, and we listen to them and try to reflect that.

*RECORD* in its long history was up against at least three other magazines in the U.S., plus the British and Italian magazines. It was a larger field for print, and now it's a larger field in terms of digital coverage.

But *RECORD* was always steadily in the middle. It wasn't *Progressive Architecture*, and yet it reflected a pretty broad spectrum of what was going on. Do you agree with that?

**RI:** Oh, I do. Absolutely.

**MS:** The magazine in my day was more than the so-called starchitects. The monthly collection of buildings contained work, such as a collection of schools, that was well designed and well described. It should be acknowledged that, besides showing greatly imaginative work, what made the magazine even better is that it paid attention to the very good everyday architectural performance.

**RI:** And, Cathleen, that's an important point about the nature of the publication—it has always struck a balance, presenting not only the edge of the wave. It's always had this pragmatic underbelly and has hoped to relate to the architects, designers, and people in the construction arena who actually go out and do the work. And so it's never been completely about the latest trend but about design excellence, and also technical knowledge. It's never been just flash and dash.

**CM:** And being more than just flash and dash is more important than ever. *RECORD*'s role is arguably even more significant in a world where, every morning, people turn on their computers or look at their phones and see a whole bunch of little postage-stamp-sized images of buildings, from all over the world, and think they know architecture from looking at those teeny pictures!

What we continue to do, which you both talked about, is to curate the best buildings of our time and select images that most accurately and beautifully reflect the experience of the building. We send writers to report on projects and we produce first-hand stories in layouts with plans and specifications, with all the information and insight that *RECORD* has been providing for decades. There really is no better way to publish the experience of what makes a great work of architecture.

Cathleen McGuigan

Cathleen McGuigan, Editor in Chief

# LEARN & EARN



Earn your continuing education credits free online on [ce.architecturalrecord.com](http://ce.architecturalrecord.com) or with *Architectural Record's* Continuing Education App!\*

## IN THIS ISSUE

Photo courtesy of Thermocromex



### Twenty-First Century High-Performance Limestone Plaster

Sponsored by THERMOCROMEX  
Credit: 1 AIA LU/HSW; 1 GBCI CE Hour

Page 226

Photo courtesy of Metl-Span



### Insulated Metal Panels On the Roof

Sponsored by Metl-Span  
Credit: 1 AIA LU/HSW; 1 GBCI CE Hour

Page 228

Photo courtesy of Architectural Record

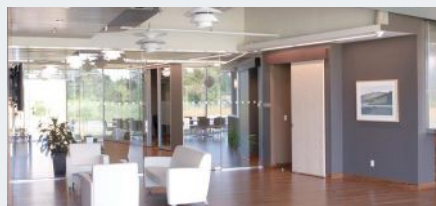


### 125 Years of Product Innovation and Evolution

Sponsored by Armstrong® Ceiling Solutions, Excel Dryer, Inc., Guardian Glass North America, NanaWall Systems, and National Terrazzo & Mosaic Association  
Credit: 1 AIA LU/HSW

Page 232

© Zahid Chafoor



### Mind the Gap

Sponsored by LogiSon Acoustic Network  
Credit: 1 AIA LU/HSW; 0.1 IDCEC CEU

Page 242

Photo courtesy of Icynene



### Moisture Control with Spray Foam Insulation

Sponsored by Icynene  
Credit: 1 AIA LU/HSW; 1 GBCI CE Hour

Page 244

Photo courtesy of LEVER Architecture



### Mass Timber in North America

Sponsored by reThink Wood  
Credit: 1.5 AIA LU/HSW; 1.5 GBCI CE Hours; 1 PDH\*

Page 248

Photo courtesy of Duro-Last®, Inc.



### Reflective Roofs and Urban Heat Islands

Sponsored by Duro-Last®, Inc.  
Credit: 1 AIA LU/HSW

Page 253

## ALSO ONLINE AT

### CE.ARCHITECTURALRECORD.COM

**Sustainable Stone From Cradle to Gate**  
Sponsored by MIA+BSI: The Natural Stone Institute and the Natural Stone Council (NSC)

**Life Cycle Assessment and Environmental Product Declarations – The Next Level of Transparency**  
Sponsored by Armstrong Commercial Ceiling Systems

**Digital Art in Architectural Projects**  
Sponsored by Forms+Surfaces

**Medal-Winning Metal**  
Sponsored by Petersen Aluminum

**Ceramic Tile: Solutions for Holistic Sustainability**  
Sponsored by Tile of Spain

**Advanced Building Envelope Solutions**  
Sponsored by BASF Corporation – North America

**Use Cementitious Wood Fiber for Great Acoustical Design**  
Sponsored by Tectum Inc.

**Advances in Manufactured Masonry Thin Veneers**  
Sponsored by Oldcastle® Architectural

**Glass-Fused-to-Steel (Porcelain Enameled) Storage Tanks Have Proven Long Lifetime Value**  
Sponsored by CST Storage

**Easing Minds and Boosting Facade Performance**  
Sponsored by Longboard – A division of Mayne Coatings Corp.

**The Architect's Guide to Specifying Sustainable Single-Ply Roofing Membranes: NSF/ANSI 347**  
Sponsored by Duro-Last®, Inc.

## NEW ONLINE AT

### CE.ARCHITECTURALRECORD.COM



### High-Performance Steel Doors and Windows for Specifiers

Sponsored by PORTELLA Steel Doors & Windows  
Credit: 1 AIA LU/HSW; 1 GBCI CE Hour

Photo courtesy of PORTELLA Steel Doors & Windows



### The Characteristics of a High-Quality LED Luminaire

Sponsored by ELP Lighting  
Credit: 1 AIA LU/HSW; 1 GBCI CE Hour; 0.1 IDCEC CEU

© David Wakely

To receive credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

\* All *Architectural Record* articles and presentations count toward the annual AIA continuing education requirement. All sponsored exams are available at no charge and are instantly processed, unless otherwise noted. This course may also qualify for one Professional Development Hour (PDH). Check your state licensing board for all laws, rules, and regulations to confirm.

## DAILY UPDATES

architecturalrecord.com/news  
twitter.com/archrecord

## perspective

*It's almost like a war zone. Nothing like this has ever happened in human history. Everybody in China has been moved.*

—Ai Weiwei, on China's construction boom, at the Asia Society in Switzerland.



Three footbridges span a landscaped bioswale, providing a buffer between the school and the bus lane. Steel columns, disguised as tree trunks, support a wavy awning that hangs over the main entrance (this photo), while inside, decorative aluminum trees adorn the glazed wall of the atrium (bottom).

## A New Chapter for the Sandy Hook School

BY MIRIAM SITZ

ON AUGUST 29, just under 500 students started their academic year at the new Sandy Hook School in Newtown, Connecticut. New Haven-based architects Svigals + Partners led the design of the 86,800-square-foot K-4 school, working closely with the community, Consigli Construction of Hartford, and a bevy of consultants to create an inviting, colorful, and secure new campus filled with light and art. “The intent of this building is to offer a warm and comfortable environment for students,” said Newtown Superintendent Dr. Joseph V. Erardi, Jr. at a media event on July 29, “and [the architects] hit a grand slam with that.”

Following the mass shooting on December 14, 2012, that took the lives of 20 children and six staff members, Sandy Hook students were transferred to the nearby town of Monroe. After a town referendum, the old '50s-era school was demolished in the fall of 2013, and Svigals + Partners, selected by the

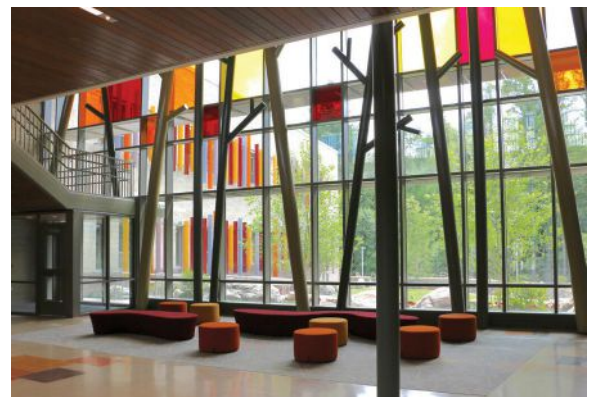
state after an open RFQ process, began meeting with a 50-member committee to understand the community's values and needs.

“In a certain way, we needed to keep at bay the history that gave rise to this architecture,” says design principal Barry Svigals. “We tried to keep our eyes on our charge—to bring our best work to the project.”

Nature emerged early on as a theme for the \$50 million project. Set against a dense backdrop of woodlands, the building's undulating facade of machiche and garapa timber planks references the surrounding forested landscape, while three gabled “houses” rising from the roof recall steeples peeking through the trees. Fieldstone along the base of the wood rainscreen nods to New England vernacular style. Toward the back of the school, the architects

used four colors of concrete block and incorporated red-, orange-, and yellow-colored fins around rear windows “to give everything a joyful or colorful touch,” explains project manager Julia McFadden.

Three footbridges, leading to the building's main and secondary entrances, span a sloped rain garden, which, in addition to filtering roof runoff, provides a topographic and spatial buffer between the school's front windows and



parking. This bioswale is just one of the many safety features discreetly folded into the project, says managing partner Jay Brotman: "It's about controlling where people can go."

Inside, the two-story building is conceived as a small town organized around a wide hallway—the "main street"—that runs the length of the building. At the school's primary entrance, the hall widens to a sunny, double-height atrium. Floor-to-ceiling glazing of the back wall allows views, from both the ground floor and a second-floor catwalk, of an outdoor amphitheater. Decorative metal trees crisscross the windows, which are colored in autumnal hues at the top, while a kinetic sculpture by artist Tim Prentice hangs from the atrium's ceiling, swaying gently.

The firm envisioned the three classroom wings as individual neighborhoods. Brightly colored overhangs above each classroom door recall front porches and visually break up the hall. Interior doors connect pairs of classrooms—yet another subtle safety feature which McFadden says school staff requested. "It helps teachers feel like they're not isolated," she says. At the ends of upstairs hallways, "tree house" breakout spaces allow students to look out into the edge of the forest behind the school. "You also get a fabulous view to the



"Tree houses" anchor the ends of each classroom wing.

courtyard," says Brotman, adding that "natural observation points are an element of security design that we looked to include as much as possible."

There are more specific safeguards too, such as a manned surveillance gate at the small road leading to the school, a "heightened level of resistance" on first-floor glazing, and "different measures of hardening on certain walls," says Brotman. (He, like all those involved with building the school, avoids specifics about the

building's security systems.)

The students also played a direct part in the design. "We have in all our projects, to varying degrees, a connection to the kids who are going to be in the building," says Svigals. At a workshop, the architects asked the children to trace the shadows of natural elements like twigs and leaves. Those drawings were digitized and carved into wooden panels that adorn the building's exterior, "reminiscent of when you carve a heart into a tree," says Svigals. Adds Brotman, "When people see reflections of themselves in the building, they actually feel a part of it."

While the school is filled with references to nature, the town, and the students, there is no specific memorial to the 2012 tragedy. (A local commission is working to establish a permanent memorial elsewhere in the community.) Yet the school's history is never far from the minds of those involved. At the July preview of the new facility, Newtown First Selectman Patricia Llodra said, "Let me state unequivocally that we would trade, in a minute, this beautiful new school for the more familiar and aged Sandy Hook School built in the '50s if we could just change the past." ■

PHOTOGRAPHY: © ARCHITECTURAL RECORD

## EarthCam Time-Lapse Cameras

Curating the art of construction since 1996



Call Us to Document and Promote Your Projects

1-800-327-8422 • [www.earthcam.net/contactus](http://www.earthcam.net/contactus)

**EarthCam.net**  
The Webcam Technology Experts  
**Celebrating 20 Years**



# ONE POUR FILLS MORE THAN FOUR (SIX TO BE EXACT).



NOW AVAILABLE  
IN FOAM



**There's only one EZ Fill™ soap dispensing system—only from ASI.** Introducing ASI's EZ Fill™ soap dispensing system—the only top-fill soap dispensing system, that can refill up to six soap dispensers with one pour. Some manufactures talk about innovation—we deliver it. Welcome to innovation—welcome to the new ASI. **For our new catalog, call 914.476.9000 or visit [americanspecialties.com](http://americanspecialties.com)**



*Integrated Solutions*  
Partitions · Accessories · Lockers

## EPA Issues Final Formaldehyde Rule

BY ANNA FIXSEN

**THE BRIGHT** white trailers started arriving in late 2005, weeks after Hurricane Katrina laid waste to hundreds of thousands of homes along the Gulf Coast. The unadorned FEMA-issued units didn't look like much—aluminum siding outside, veneer-clad cabinetry inside—but, to their displaced occupants, the trailers were a godsend.

"It had that great brand-new smell that I thought was just wonderful," said Jennifer Donelson of Gulfport, Mississippi, in a 2008 interview with a Sierra Club member. "I had never had anything brand-new before."

But the smell that had symbolized a fresh start made Donelson, her family, and hundreds of others sick. "It could almost knock you down," remembers Becky Gillette, the Sierra Club volunteer, who also lived in Mississippi.

The symptoms weren't subtle: burning eyes and throat, nausea, nosebleeds, and a relentless croup known to residents as "trailer cough" or "Katrina crud."

Gillette's neighbor, who lived in a FEMA trailer, had a suspicion the symptoms were caused by formaldehyde—a carcinogenic chemical commonly used in the composite wood products that make up flooring, furniture, cabinetry, and other elements of interiors.

Beginning in April 2006, Gillette, in partnership with her Sierra Club chapter, tested 69 trailers and found the vast majority had formaldehyde levels exceeding what was considered safe. Testing by the Environmental Protection Agency (EPA) and the Centers for Disease Control and Prevention confirmed the findings.

But in subsequent years, the federal government did little to standardize and regulate formaldehyde in building products. In the meantime, the chemical was found at toxic levels again in FEMA trailers supplied to victims of Iowa's floods in 2008, and, last year, in Chinese-made laminate flooring from Lumber Liquidators—a product that was probably installed in tens of thousands of homes across the U.S., according to a report by *60 Minutes*.

On July 27—nearly a decade after the first FEMA-trailer scandal—the EPA issued its final regulation to safeguard the public from the chemical. The rule, which Congress directed the EPA to finalize, calls for domestic and imported composite wood products—including hardwood plywood, medium-density fiberboard, and particleboard—to be labeled as compliant with Title VI of the Toxic Substance Control Act and to be monitored by third-party certifiers. After the rule is published in the Federal Register—a



Toxic levels of formaldehyde in FEMA-issued trailers (above) were due to the resins in composite wood products (left).

process that could take several weeks—panel producers will have one year to comply, according to an agency spokesperson.

"The new rule will level the playing field for domestic manufacturers . . . and will ensure that imported products . . . will meet the new standard," said Jim Jones, an EPA official, in a statement.

The EPA emission standards mirror rules set forth by the California Air Resources Board (CARB), legislation that went into effect in 2009. Prior to the California regulations, formaldehyde emissions from composite wood panels and finished goods were commonly as much as 20 times higher than the new standards.

The emission standards for the EPA rule are nearly identical to the CARB formaldehyde standards, primarily targeting the use of urea-formaldehyde resins (UF). The rules for hardwood plywood with both a veneer and a composite core would limit formaldehyde emissions to no more than 0.05 parts per million (ppm), while thin medium-density fiberboard could emit up to 0.13 ppm. As with the California standards, composite wood product producers, importers, and distributors, must also have their products tested regularly by a third-party monitor.

There are, however, a few changes to the CARB rules, including requirements for additional record-keeping. The EPA rule also obliges manufacturers to disclose the results of their quality-control tests—meaning that the public, via a Freedom of Information Act request, could access the information.

The wood industry is supportive of the new rule. According to the Engineered Wood Association, the new rule "prevents inconsistencies that could have resulted with state-by-state

regulations." The president and CEO of the American Wood Council, Robert Glowinski, said the new legislation is "consistent with good product stewardship."

But environmental advocates are more cautious. "It looks to me like the EPA has done a pretty good job," says Tom Lent, the policy director at the Healthy Building Network, "but the devil in these things is enforcement."

"Our position was to move the industry away from formaldehyde entirely, given that we felt it was starting to develop some good alternatives," says Lent, citing the fact that some manufacturers have introduced soy-based adhesives in lieu of formaldehyde.

One portion of the rule that is cause for concern, says Lent, is an extended seven-year grace period for laminated products, a time frame, according to the EPA, that is "more realistic."

"It's not exactly kicking the can down the alley, but it makes it a long runway before this actually starts taking effect," says Lent. "If you are just starting a hospital project, this is probably good news, but for everyone with a faster timeline, you still need to figure out how to avoid formaldehyde emissions."

According to the EPA, the rule will impact nearly 1 million small businesses. But, because of the CARB standards, many are already compliant. "There will be more impact on regional manufacturers who haven't been paying attention to the California market," predicts Lent. "Hopefully, the rule will have a big impact on Chinese companies."

While the burden of the new EPA ruling falls primarily on the shoulders of composite wood manufacturers, ultimately, according to Lent, the architectural profession needs to set the bar higher for healthy building products and create a market for formaldehyde-free alternatives.

"Anything you can pull off [to reduce emissions] is going to positively affect a life," says Lent. "The work we do as specifiers, architects, and interior designers is even more important than the footprint of the individual project." ■

PHOTOGRAPHY: © KUNST HALLE SANKT GALLEN/STEFAN JAEGGI (LEFT); FLAUNT MAGAZINE (RIGHT)

# A Modest Proposal for Luis Barragán's Estate

BY MIRIAM SITZ

**BROOKLYN-BASED CONCEPTUAL** artist Jill Magid spent years plotting the perfect proposal—the location, the rock, the words—but what she had in mind was a bit different from most. On September 9 at the San Francisco Art Institute, Magid will exhibit a 2-carat diamond ring, created by compressing the cremated remains of Mexican architect Luis Barragán, to represent her proposal to the owners of his professional archive: open Barragán's legacy to the public.

When the Pritzker Prize-winner died in 1988, his estate was divided between two close business colleagues. Barragán's library became the museum Casa Luis Barragán—a UNESCO World Heritage Site since 2004. But the rights to the architect's papers, drawings, and photographs have proved a more complicated matter. After Barragán's beneficiary committed suicide in 1993, the archive was sold for a reported \$3 million to Rolf Fehlbaum, chairman emeritus of his family's furniture company, Vitra, and his wife,

Federica Zanco, an Italian architectural historian. The couple shipped Barragán's estate to Vitra's headquarters in Birsfelden, Switzerland, where it has remained ever since, accessible only to Zanco, a few scholars, and an assistant.

Magid launched her investigation of Barragán in 2013, negotiating with his descendants and the Mexican government for a year before gaining access to the architect's remains in 2015. This spring, she visited Zanco in Switzerland to explain her art project and to propose with the ring—a body of work in exchange for the body of the architect.

"You say it should go back to Mexico. Back to whom? Under what circumstances?" Zanco told *The New Yorker*, following her meeting with the artist in May. Though she has praised Magid and her project, Zanco remains protective of her rights to the work—and of its sanctity. She



*The Proposal* features a rough-cut diamond (left), made from 1 pound of Luis Barragán's ashes. The ring is inscribed with the text "I am wholeheartedly yours," handwritten at right over a photograph of the artist.

continued: "You agree [to allow people to use photos], and then you see them in a spread in a fashion magazine for something about how pink is the new color for spring." Zanco has yet to accept Magid's proposal.

Following the exhibition's opening in Kunst Halle Sankt Gallen in Switzerland, *The Proposal*—which includes Magid's documents and correspondence related to the project, as well as a video of the exhumation of Barragán's remains—will be on view at the San Francisco Art Institute through December 10. ■

**HUNTCO**  
SITE FURNISHINGS

**THE TILIKUM**

A new angle on bike parking

See it at: [Huntco.com](http://Huntco.com)  
Follow us on Twitter for more news.

@HUNTICOSUPPLY

# Yale's Beinecke Library Restored

BY FRED A. BERNSTEIN

**THE BEINECKE** Rare Book & Manuscript Library at Yale University, designed by Gordon Bunshaft of Skidmore, Owings & Merrill, is a modernist masterpiece. Its rectangular volume is enclosed in sheets of marble, thin enough (at 1/8") to transmit light. That means the interior of the building glows by day. But it also posed "a major challenge," says Bill Mahalko, who, as project architect for Chicago's HBRA Archi-

itects, oversaw a 16-month, \$70 million renovation of the building. New Haven's Newman Architects was architect of record.

"The thermal qualities of the marble are similar to those of single-pane glass," says Mahalko. "It's not a good insulator." In cold weather, condensation formed inside the building, which houses some of the world's most precious volumes—including a Gutenberg Bible.

When the building reopens on September 6, it will look the same on the outside as it did when it was completed in 1963. But its mechanical systems have been entirely revamped, solving the condensation problem and many others. Bronze display cases on the main level were sealed and fitted with environmental controls. (Previously, ambient air passed right through the cases.)

The architects restored the library's dramatic "book stack" (a six-story glass volume within the larger volume) and reconfigured the administrative spaces below the building's plaza. An Isamu Noguchi sculpture garden, sunk into that plaza, has been returned to its original condition.

The building already contained two classrooms, below grade but visible from much of

## Managing Building Energy Costs... Very Cool.



'Cool Roofs' from Kemper System offer among the highest solar reflectance ratings in the industry to help keep a lid on building energy costs. In addition, since the Reflect 2K FR System does not require a topcoat, easier installation means less time and labor costs.

Designed for extended performance, these fully reinforced, cold liquid-applied roofing membrane systems are from the company that invented the technology in 1957.

Choose either odor-free:

**Kemperol® Reflect 2K FR System** (SRI 110)

Or fast curing PMMA:

**Kemperol® AC Speed FR System** (SRI 108)

Both products exceed LEED solar reflectance requirements and achieve a Class A Fire Rating.

Contact us now to learn more or request a FREE presentation: 800-541-5455.



 **KEMPER**  
SYSTEM

KEMPER SYSTEM AMERICA Inc.  
1200 North America Drive, West Seneca, NY 14224  
800.541.5455 • www.kempersystem.net



Yale's Beinecke library, designed by Gordon Bunshaft and completed in 1963, was fully revamped by HBRA Architects to protect its rare book collection.

its interior. It now contains two more, designed by Mahalko to blend in with Bunshaft's architecture. One of the classrooms houses an antique printing press and other equipment, allowing students to explore the physical properties of books.

HBRA was led for many years by Thomas Beeby (now the firm's chairman emeritus), whose best-known building is the aggressively Postmodernist Harold Washington Library in Chicago. The firm's ground-up projects generally hew to traditional styles, "but in the restoration area, we do a lot of modernist work," Mahalko says.

The firm began working on the Beinecke library back when Beeby was dean of the Yale School of Architecture (1985 to 1991), completing a number of small projects culminating in the recent commission. Beinecke library director Edwin Schroeder said, "The renovation ensures that the Beinecke library will remain a world-class center for teaching, research, and scholarship for decades to come." ■



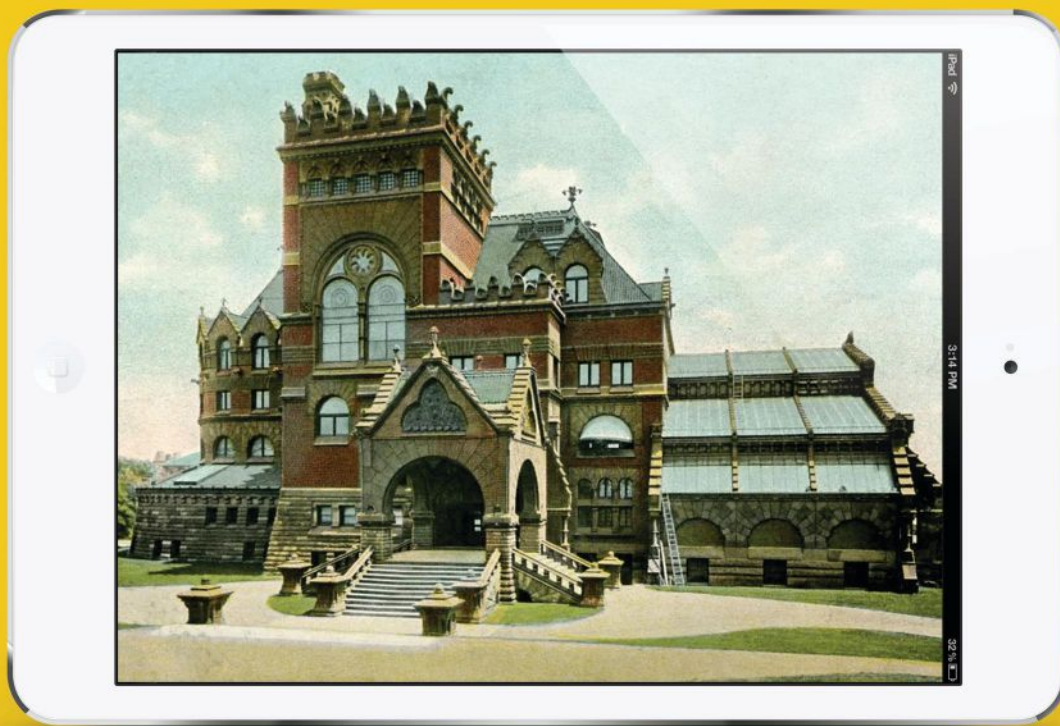
## Sherwin-Williams. Available in a variety of locations.

*Of course, you know Sherwin-Williams for innovative paints. But did you know that we can help you in other areas of your specification, too? Count on us for flooring systems, concrete coatings, caulks, sealants and more.*

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



# GUESS THE ARCHITECT WIN AN IPAD MINI



PHOTOGRAPHY: COURTESY WIKIMEDIA COMMONS

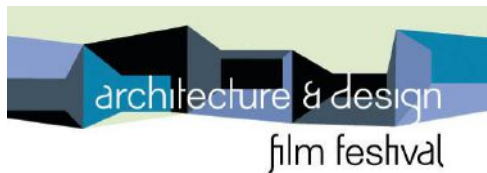
TAKE A LOOK ON PAGE 45 ►  
ENTER @ [ARCHITECTURALRECORD.COM/GUESSTHEARCHITECT](http://ARCHITECTURALRECORD.COM/GUESSTHEARCHITECT)

**ARCHITECTURAL  
RECORD**  
**Guess the Architect Contest**

FOR COMPLETE RULES AND REGULATIONS GO TO [ARCHITECTURALRECORD.COM/GUESSTHEARCHITECT](http://ARCHITECTURALRECORD.COM/GUESSTHEARCHITECT)

Sponsored by:





## Film Festival Celebrates Design

BY ANNA FIXSEN

LIKE **JASON BOURNE**, this summer's blockbusters seem to have suffered from a case of cinematic amnesia. Filmmakers resurrected *Ghostbusters* and *The Jungle Book* while moviegoers endured a second dose of *Independence Day* and an impressive fifth helping of Mr. Bourne. Thankfully, New York's Architecture & Design Film Festival this month promises to screen some original—and architectural—flicks. The annual showcase, now in its eighth edition, will feature a lineup of more than 30 feature-length and short films, all focused on architecture and design.

The festival will kick off with the world premiere of *Eero Saarinen: The Architect Who Saw the Future*. Directed and produced by Peter Rosen, the film explores the life and work of the Finnish American architect through stunning cinematography (by Saarinen's own son, Eric) and interviews with a host of experts.

Other selections are more offbeat. *The Happy Film*—a Tribeca Film Festival favorite—follows designer Stefan Sagmeister (at times prancing through New York in a pink bunny suit) and his existential quest to achieve happiness. Another film, called *Where Architects Live* and based on an exhibition at the 2014 Salone del Mobile of the same name, ushers viewers into the inner sanctums of Shigeru Ban, Daniel Libeskind, the late Zaha Hadid, and more. Who isn't itching to see where David Chipperfield sleeps?

The *Architectural & Design Film Festival* will take place from September 28–October 2 at the Cinépolis Chelsea in New York. ■



The annual Architecture & Design Film Festival will include the debut of a documentary about Eero Saarinen (above).

# LET YOUR CREATIVITY FLY CREATE BEAUTIFUL BUILDINGS START TO FINISH.



*"With TerraNeo, we've created a new standard – we've literally changed the market. I've designed over 2 million square feet of Class A office space utilizing TerraNeo – and that has freed us to have the look of granite but with shapes and forms we simply couldn't do out of stone."*

**JORY MORGAN WALKER, AIA**  
PRINCIPAL ARCHITECT  
BEECHER WALKER ARCHITECTS  
HOLLADAY, UTAH



Let your creativity fly by taking advantage of innovative finishes like TerraNeo® over an Outsulation® system to craft the look of stone or granite. You give the owner a building that will look fantastic and at a lower installed cost, a lower operating cost, and it will meet building codes that require continuous insulation. That means better performing and better looking buildings.

Call 800.556.7752 or visit us at [dryvit.com](http://dryvit.com).

**dryvit**<sup>®</sup>  
pushing the building envelope



[ NEWSMAKER ]

## Michael Miner

BY ANNA FIXSEN

FRANK LLOYD WRIGHT once said that it is “just as desirable to build a chicken house as to build a cathedral.” Filmmaker Michael Miner took that to heart but, instead, built an unrealized doghouse of Wright’s design. Miner now wants to rebuild another forgotten FLW work—this time, a pavilion in Banff,

Alberta. The building, a low-slung rustic timber structure with a cantilevered roof and art glass windows, was completed in 1914 and served as a gathering point for tourists visiting the national park. Due to extreme winters and flooding, the building deteriorated and was demolished 25 years after it opened. A sports field now occupies the site. Miner hopes, through grassroots fundraising by his nonprofit, the Frank Lloyd Wright Revival Initiative, to give the reconstructed pavilion back to the town. The reconstruction, which Miner estimates will cost \$2.2 million Canadian dollars, has won preliminary support from the town council and is the subject of a feasibility study. RECORD spoke with Miner about the project.

How did you first fall in love with FLW’s work? Ironically, I had a girlfriend who was very much into Frank Lloyd Wright when we dated. At least something good came out of the relationship. Yeah, something, exactly. I had the opportunity, after that particular relationship broke up, to take a three-year road trip, and I got to visit many of Wright’s buildings. I was so taken by the experience, I did a series of Wright films. Why did you establish the Frank Lloyd Wright Revival Initiative? As I experienced Wright’s buildings and saw some restoration efforts, I thought there was a better way to do it. We evaluated all the build-



ings that had been demolished and decided which would be relatively easy to build and relatively inexpensive. In 2013, I visited Banff with my wife and dog, and we approached the town council about resurrecting the Pavilion. Have you had naysayers? Of course, even when I posted on my organization’s Facebook page, we had a couple of people who were like, “So are you going to call them Wright-inspired buildings?” I said, “No—this is not a cheap imitation. We are using Wright’s plans, except with modifications that are inescapable because of modern building codes. So you have the original plans? We do. These plans are in the archives of Canada and Ottawa. We have all of the working drawings and all of the specifications. I was talking to Eric Lloyd Wright [FLW’s grandson], and said if we want to do this exactly as Wright intended, we have to have a horse and cart for 75 cents an hour to get the wood to the site.

What was your pitch to the town? My initial pitch was that it would be good for tourism, and it would right a historical wrong. I talked to the town planner in 2013 and it went nowhere, but earlier this year I got a call from the Canadian press because the town had a new redevelopment plan. Have you enlisted an architect? We have not. Right now, we’re fundraising, and the next thing will be a call for architects. We want a lead Canadian architect for both the politics and for the practicality. Ironically, this is what FLW did then—he was not licensed to practice in Canada, so his Canadian student, Francis C. Sullivan, was his architect of record. And the Revival Initiative would fund the project? I have no intention of taking any government money from America or Canada whatsoever. I don’t like the idea of begging for money—I like the idea of everyone having a stake in it and feeling like they are part of it. ■

Of course, even when I posted on my organization’s Facebook page, we had a couple of people who were like, “So are you going to call them Wright-inspired buildings?” I said, “No—this is not a cheap imitation. We are using Wright’s plans, except with modifications that are inescapable because of modern building codes.

So you have the original plans? We do. These plans are in the archives of Canada and Ottawa. We have all of the working drawings and all of the specifications. I was talking to Eric Lloyd Wright [FLW’s grandson], and said if we want to do this exactly as Wright intended, we have to have a horse and cart for 75 cents an hour to get the wood to the site.

What was your pitch to the town? My initial pitch was that it would be good for tourism, and it would right a historical wrong. I talked to the town planner in 2013 and it went nowhere, but earlier this year I got a call from the Canadian press because the town had a new redevelopment plan. Have you enlisted an architect? We have not. Right now, we’re fundraising, and the next thing will be a call for architects. We want a lead Canadian architect for both the politics and for the practicality. Ironically, this is what FLW did then—he was not licensed to practice in Canada, so his Canadian student, Francis C. Sullivan, was his architect of record. And the Revival Initiative would fund the project? I have no intention of taking any government money from America or Canada whatsoever. I don’t like the idea of begging for money—I like the idea of everyone having a stake in it and feeling like they are part of it. ■

horse and cart for 75 cents an hour to get the wood to the site.

What was your pitch to the town? My initial pitch was that it would be good for tourism, and it would right a historical wrong. I talked to the town planner in 2013 and it went nowhere, but earlier this year I got a call from the Canadian press because the town had a new redevelopment plan. Have you enlisted an architect? We have not. Right now, we’re fundraising, and the next thing will be a call for architects. We want a lead Canadian architect for both the politics and for the practicality. Ironically, this is what FLW did then—he was not licensed to practice in Canada, so his Canadian student, Francis C. Sullivan, was his architect of record. And the Revival Initiative would fund the project? I have no intention of taking any government money from America or Canada whatsoever. I don’t like the idea of begging for money—I like the idea of everyone having a stake in it and feeling like they are part of it. ■

My initial pitch was that it would be good for tourism, and it would right a historical wrong. I talked to the town planner in 2013 and it went nowhere, but earlier this year I got a call from the Canadian press because the town had a new redevelopment plan. Have you enlisted an architect? We have not. Right now, we’re fundraising, and the next thing will be a call for architects. We want a lead Canadian architect for both the politics and for the practicality. Ironically, this is what FLW did then—he was not licensed to practice in Canada, so his Canadian student, Francis C. Sullivan, was his architect of record. And the Revival Initiative would fund the project? I have no intention of taking any government money from America or Canada whatsoever. I don’t like the idea of begging for money—I like the idea of everyone having a stake in it and feeling like they are part of it. ■

We have not. Right now, we’re fundraising, and the next thing will be a call for architects. We want a lead Canadian architect for both the politics and for the practicality. Ironically, this is what FLW did then—he was not licensed to practice in Canada, so his Canadian student, Francis C. Sullivan, was his architect of record. And the Revival Initiative would fund the project? I have no intention of taking any government money from America or Canada whatsoever. I don’t like the idea of begging for money—I like the idea of everyone having a stake in it and feeling like they are part of it. ■

Right now, we’re fundraising, and the next thing will be a call for architects. We want a lead Canadian architect for both the politics and for the practicality. Ironically, this is what FLW did then—he was not licensed to practice in Canada, so his Canadian student, Francis C. Sullivan, was his architect of record. And the Revival Initiative would fund the project? I have no intention of taking any government money from America or Canada whatsoever. I don’t like the idea of begging for money—I like the idea of everyone having a stake in it and feeling like they are part of it. ■

I have no intention of taking any government money from America or Canada whatsoever. I don’t like the idea of begging for money—I like the idea of everyone having a stake in it and feeling like they are part of it. ■

## Competition Reimagines the New York State Pavilion in Queens

The National Trust for Historic Preservation and People for the Pavilion have revealed the winners of a contest to redesign Philip Johnson’s New York State Pavilion, on the site of the 1964–65 World’s Fair. The first-prize entry, designed by Seattle architects Aidan Doyle and Sarah Wan, uses the existing structure as a base for an elevated, glass-enclosed park.

## Harvard Art Museums Launch Online Bauhaus Collection

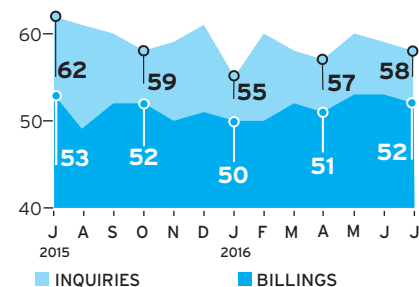
On August 15, the Harvard Art Museums launched a new online resource that allows the public to access more than 32,000 Bauhaus-related objects and records in the museum’s collection, including paintings, drawings, prints, and photography. The digital repository will also be the subject of an exhibition on the movement’s Centennial in 2019.

## Memorial to Lynching Victims Unveiled in Alabama

The Equal Justice Initiative (EJI), a legal-rights organization in Montgomery, Alabama, has unveiled designs, created in partnership with Boston-based MASS Design Group, for a memorial honoring the victims of the more than 4,000 racial lynchings in United States history. Planned for six acres of vacant land in downtown Montgomery, the memorial will include a museum at the EJI headquarters.

## Snøhetta to Design Banque Libano Francaise HQ in Beirut

Snøhetta has been selected to design the Banque Libano Francaise headquarters in Beirut, the firm’s first commission in Lebanon. The building will feature exterior terraces and interior elements such as stepped seating areas, private glass-box meeting rooms, and elevated lounges.



## ABI Remains in Positive Territory

July finished with a positive Architecture Billings Index (ABI) mark of 51.5 points (any score above 50 indicates an increase in billings). This marks the sixth consecutive month in which the ABI has remained in positive territory. The projects inquiry index dipped slightly to 57.5, down 1.1 points from June’s score.





Bank of America Headquarters San Antonio, TX Designer: Carson Design Associates  
Acpexpress 3D Concave Panels



CIRCLE 249



## Acpexpress 3D Concave Panels

2-14

14-28



[www.ACPEXPRESS.com](http://www.ACPEXPRESS.com) 1-844-227-3977 [sales@acpexpress.com](mailto:sales@acpexpress.com)

# WHEN THE BEST WANT THE BEST

## TWO HOUR FIRE RESISTIVE CURTAIN WALL

2 HOUR FIRE RESISTIVE GLASS  
INTERIOR/ELEVATOR ENCLOSURE  
WITH SUPERLITE II-XL 120  
IN GPX CURTAIN WALL FRAMING



**Architect:**  
Sieger Suarez Architects  
**General Contractor:**  
Coastal Construction Group  
of South Florida Inc.  
**Glazing Contractor:**  
Continental Glass Systems

RENDERING COURTESY OF METROSTUDIO.COM

SIEGER SUAREZ ARCHITECTS  
60-STORY PORSCHE DESIGN TOWER

888.653.3333  
WWW.SAFTI.COM

 **SAFTIFIRST**<sup>™</sup>  
SAFETY AND FIRE TECHNOLOGY INC.



OLSON KUNDIG RESTORES A MIDCENTURY HOUSE AND ADDS SOME TOUCHES OF ITS OWN. BY LYDIA LEE



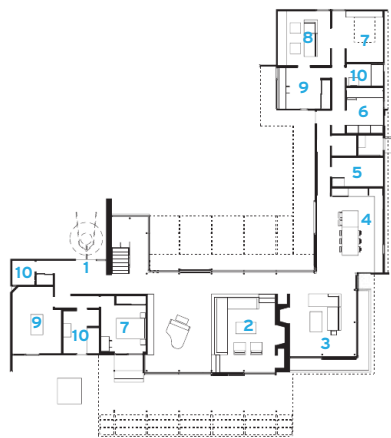
**AFTER MORE** than six decades, even homes designed during the peak of Modernism are starting to look dated. Seattle-based Olson Kundig recently revived a classic example from 1951, perched high up in the hills of Berkeley, California. “It was a solid midcentury house, with a strong parti,” says principal Tom Kundig. “Our challenge was to maintain the spirit of the building.”

The original architect, John Ekin Dinwiddie, is one of the now-forgotten practitioners in the Bay Area who were pushing the envelope. The house he designed for his sister-in-law caused consternation among the neighbors on this closely packed hillside, overlooking the East Bay and San Francisco. Dinwiddie organized the building around the view, designing the living room as a long, fully glazed bar with the panorama of the Bay in front and a quiet courtyard in back. On the south end of the bar, he placed a wing with the dining area, kitchen, and maid’s quarters; he bracketed the north end with a two-story volume with bedrooms on both

The original pale pink stucco and redwood siding was replaced with cedar siding stained black (above).

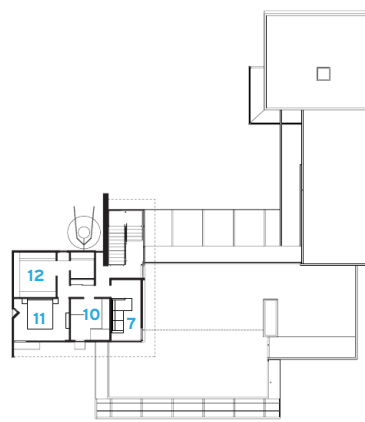
levels and clad two impressive walls in Southwestern stacked-stone veneer that is very evocative of the era. But the house’s most startling element is an 8-foot-wide circular metal canopy, inset with a thick glass disc, that shades the front door. (It’s worth mentioning that Dinwiddie studied architecture with Eliel Saarinen at the University of Michigan in the 1920s and briefly partnered with Erich Mendelsohn while the German émigré taught at the University of California, Berkeley.)

When the new owners, a couple with a young child, purchased the house in 2010, it was largely in its original condition, save for a subpar kitchen renovation from the 1980s. Over the years, it had fallen into considerable disrepair—the sliding door in the living room had been caulked shut. “The clients liked the building, but wanted us to stabilize it and take the underlying thought a step further,” says Kundig. “That midcentury idea of open-



GROUND FLOOR

0 12 FT.  
4 M.



SECOND FLOOR

0 12 FT.  
4 M.

- 1 ENTRY
- 2 LIVING
- 3 DINING
- 4 KITCHEN
- 5 PANTRY
- 6 LAUNDRY
- 7 BEDROOM
- 8 MEDIA ROOM
- 9 OFFICE
- 10 BATH
- 11 MASTER BEDROOM
- 12 DRESSING ROOM



The living area is a long bar with views of the Bay in front and a courtyard in back (above). A stacked stone wall is a signature element of Dinwiddie's design (bottom, left). A circular metal canopy inset with a thick glass disc shades the entrance (bottom, right).

ing up to the garden is still a tenet today. But now we're more transparent between those parts and pieces."

The house, which has a concrete-slab and spread-footing foundation with wood and steel framing, was gutted and rebuilt. The design team augmented the two wings, increasing the building's 4,000 square feet to 4,300 square feet; substantially reconfigured the bedrooms and bathrooms; and removed the wall between the kitchen and dining room to create one continuous family gathering place. For energy efficiency, the architects switched out the single-paned glazing for aluminum-framed double-paned windows and immense sliding doors, carefully matching the glazing units' dimensions to the grid established by the existing structural columns.

The defining architectural features—the transparent living room,



stacked-stone walls, geometric sun shades, and round canopy—are all as they had been. The architects also restored the ground level's concrete flooring, removing the ceramic field tile that had been installed in the intervening years.

But there are also a few light touches that particularly show the hand of the most recent architect. The two-story volume features two narrow recessed windows, set at an angle, that provide light but also privacy from neighbors to the north. The newly enlarged front door (now 5 feet wide and 9 feet tall) is outfitted with an industrial-chic lockset from Kundig's own hardware line. And the original pale-



pink stucco and redwood siding is now all vertical cedar siding, stained black. "I wanted to articulate the diagram of the house—the solid ends with the transparent interior—more emphatically," says Kundig. "I'm engaging this person who is no longer with us, in the language that has been passed down through generations, trying to understand what he was saying about how to live." ■



*Park Chelsea, Washington, DC  
Architect: Esocoff & Associates Architects*



*Golden Dawn (S27-28), in Econo, Saxon and Titan sizes.  
Visit [glengery.com/parkchelsea](http://glengery.com/parkchelsea) for full details.*

## Build beauty with us

Colors, textures, sizes, shapes and materials—  
Glen-Gery provides architects and designers the  
largest palette of hard surface options to bring visions  
to life. To learn what's possible call 610.898.3998 for  
our idea book or visit [glengery.com](http://glengery.com)

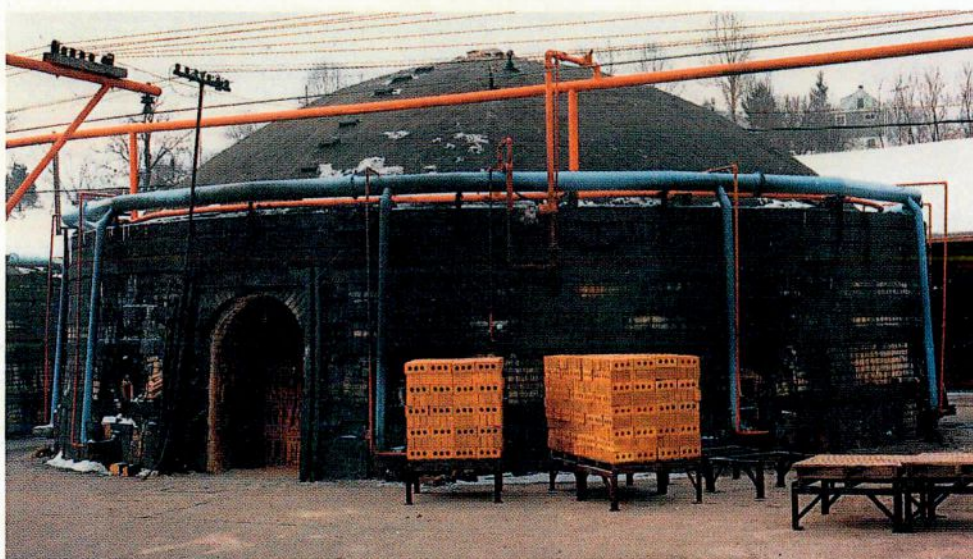


*Timeless. Elegant. Durable.*

# IF YOU NEED TO RECAPTURE HISTORY,



## BORROW SOME OF OURS



**W**hen you're involved in a restoration project, you may need brick that simply isn't available in today's market. But that doesn't necessarily mean it can't be available.

For more than a century, Belden Brick has been synonymous with quality brick in a broad range of colors, sizes and shapes. Our history may well include the brick you need to restore a structure — and perhaps be made today in traditional beehive kilns used extensively in earlier days.

When you're trying to recapture history and need the authentic look of yesterday's brick, you may find our history uniquely helpful.

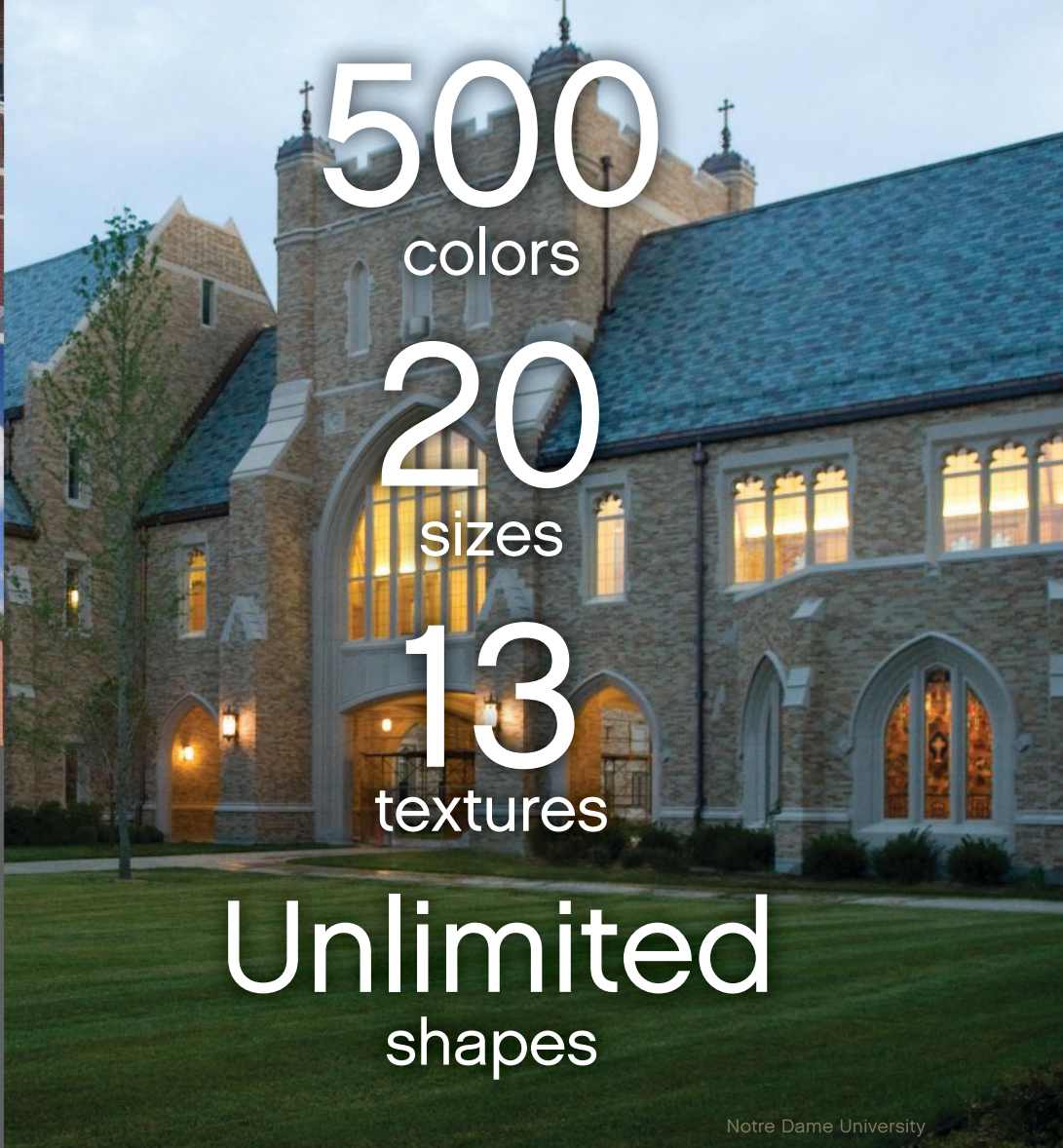
Frequently we can turn yesterday into today.



CIRCLE 180



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



500

colors

20

sizes

13

textures

Unlimited  
shapes

Notre Dame University

**BELDEN**  
THE BELDEN BRICK COMPANY



CIRCLE 180

Kent State University

## PROVEN PERFORMANCE, ENDLESS POSSIBILITIES

The Belden Brick Company is privileged to serve colleges, universities and schools throughout North America with more options than any other brick manufacture in the world. As the industry leader in delivering the largest selection of more than 500 colors, 20 sizes, 13 textures and unlimited shapes, Belden will meet all your product needs with the time-honored quality and experience we've mastered.

**The Standard of Comparison Since 1885**

An ISO 9001 Compliant Quality Management System.  
An ISO 14001 Compliant Environmental Management System.

# PITCH PERFECT

"Properly designed, metal fits nearly every architectural style and offers great durability."

Michael Lucas, Basham & Lucas Design Group



**SNAP-CLAD**

Galvalume Plus - Energy Star

Westminster Woods, Jacksonville, FL

Owner: Westminster Communities of Florida

Architect: Basham & Lucas Design Group

Installing contractor: Mac Johnson Roofing

Profile: Snap-Clad

Color: Galvalume Plus

CASE STUDY



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

CIRCLE 243

Proud sponsor of the ARCHITECTURAL RECORD GUESS THE ARCHITECT



# ARCHITECTURAL RECORD

## Guess the Architect Contest

**ENTER NOW!** A monthly contest from the editors of RECORD asks you to guess the architect for a building of historical importance.



**CLUE: A 19TH-CENTURY ARCHITECT WHO BOLDLY EXPERIMENTED WITH AN ECLECTIC MEDIEVAL VOCABULARY GAVE HIS HOME CITY A RUGGEDLY MASONIC CHARACTER. TODAY A LEADING UNIVERSITY'S FINE ARTS AND ARCHITECTURE LIBRARY IS HOUSED IN ONE OF HIS BUILDINGS.**



The answer to the August issue's Guess the Architect is Otto Wagner, who completed the Post Office Savings Bank in Vienna in 1912, the year his work appeared in RECORD (May 1912, page 485). The building, commended for its modern lines and use of aluminum, translucent glass block, and reinforced concrete, also featured furniture designed by the architect.

By entering, you have a chance to win an iPad mini.

See the complete rules and entry form online at [architecturalrecord.com/guessthearchitect](http://architecturalrecord.com/guessthearchitect).





## Cuisine Art

Like a carefully composed dish, SFMOMA's In Situ restaurant was crafted with layers of texture by Aidlin Darling Design.

BY LYDIA LEE

A MUSEUM is all about curation. It now seems that a museum restaurant should also be curated, at least according to chef Corey Lee, who had an inspired concept for the San Francisco Museum of Modern Art's new flagship eatery. At In Situ, every dish is from the menu of a top culinary outpost elsewhere. For instance, the restaurant's changing menu might include Wylie Dufresne's shrimp grits from New York's wd~50 and a dessert of wood sorrel and sheep-milk yogurt by René Redzepi from Copenhagen's Noma. Given the eclectic origins of the offerings, the backdrop could have defaulted to a gallery-like sterility. But local firm Aidlin Darling Design created a space that is very much in situ, with subtle details that delight the visual palate.

SFMOMA recently unveiled a major addition

and renovation by Snøhetta (RECORD, May 2016, page 142), which located the 6,300-square-foot restaurant in former café and event spaces off the lobby of the original 1995 Mario Botta building. The dark-toned room smoothly segues from the museum's entry, which has a black and gray granite floor. According to chef Lee, "I didn't want the space to feel like a typical restaurant, but an extension of the museum where food happened to be served."

Inside, the floor is concrete, the ceiling is black expanded metal mesh, and the walls are finished in white paint, dark gray acoustic felt, and cement scratch coat. "The idea was to

More than 66 feet long, a wood-slat canopy spans the lounge and dining areas, leading toward an artwork by Tucker Nichols on the rear wall (opposite and top). Blackened half-inch-round steel rods define the entry (right).





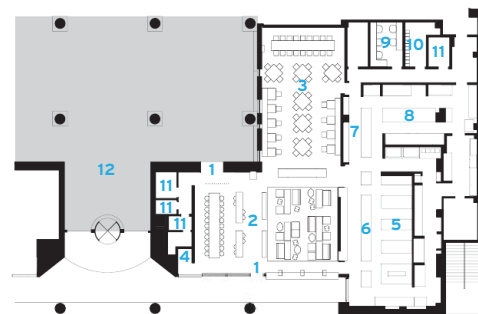
In shades of white, a mural by Rosana Castrillo Diaz (above) visually shifts depending on the light. A cement scratch coat adds texture to the dining room (below).



create a raw shell, with a mediating layer, and a few carefully placed elements," says principal David Darling, so "the food becomes the final art in the space."

Custom-crafted furnishings reinforce the artful qualities. Inspired by the rough-hewn work of British sculptor David Nash, bar-height tables made from salvaged cottonwood have craggy undersides that speak to San Francisco's penchant for natural wood, without devolving into cliché. Overhead, slender blackened-steel pipe pendants are an homage to *The Lightning Field* by Walter De Maria. An expansive ceiling installation of wood slats by the architects is a riff on a food-drying rack.

In keeping with the museum's mission of making art accessible, the architects devised a range of casual seating areas for 130 people (two-thirds of the space is for walk-in customers). In addition to the bar tables, there is a low-slung lounge as well as a long window seat that overlooks the street. The dining area features simple tables with ash tops and sculptural Osso chairs by Paris-based designers Ronan & Erwan Bouroullec. Partially screened by a wall clad in cold-rolled steel plate, the kitchen provides glimpses of the craft involved in creating edible works of art. ■



FLOOR PLAN

0 16 FT.  
5 M.

- |                  |                  |
|------------------|------------------|
| 1 ENTRANCE       | 7 WAITER STATION |
| 2 LOUNGE SEATING | 8 PREP KITCHEN   |
| 3 DINING         | 9 OFFICE         |
| 4 LIBRARY        | 10 LOCKERS       |
| 5 COOK LINE      | 11 RESTROOMS     |
| 6 BAR            | 12 SFMOMA LOBBY  |



CATALOG 20

## MORE THAN A CATALOG, AN ESSENTIAL INDUSTRY TOOL

The most comprehensive source for the highest quality architectural metal is also the final word on related building codes, reference standards, allowable spans, load distribution and more.

Catalog 20 might just be the handiest addition to your toolbox.



REQUEST A COPY BY VISITING  
[juliusblum.com](http://juliusblum.com)

P.O. Box 816, Carlstadt NJ 07072

OR BY CALLING  
1.800.526.6293

# Parametrics and Power

How the social, economic, and political forces that impact architecture are moving to shape the future.

BY MICHAEL SORKIN

AMERICA IS having a Frank Capra moment. Not one of those uplifting finales but the scene in *It's A Wonderful Life* where George Bailey (builder of affordable housing, savings and loan owner of unimpeachable generosity and ethics, honorer of veterans, monogamy incarnate!) hallucinates (on a trip induced by Clarence, his guardian angel) what might have happened to his beloved Bedford Falls had he never been born and the evil Henry Potter supplanted him as the town's leading citizen and spirit. It's a picture of unmitigated darkness, filled with "cocktail bars, casinos, and gentleman's clubs," rife with poverty, crime, misery.

Sound familiar? This could be Trump's America, evoked in his doom-laden convention speech depicting our prospective future, and in the version of the country he has spent so many decades constructing in reality: those cocktail bars, casinos, and clubs. With the help of many of our leading practitioners—from Philip Johnson to Der Scutt to Adrian Smith—Trump has done more building than any politician since Jefferson (even if Trump University is a little more virtual and a little less rigorous than the University of Virginia, and Mar-a-Lago a skosh glitzier than Monticello!).

The candidate is Exhibit A for architecture's inextricable ties to the social and economic forces that produce it: architecture is always going to the same place as everything else. Ours is not an autonomous discipline operating in a free field. Rather, it's ever engaged in a deepening struggle to find the terms of its own distinction and necessity, especially now, as the designed environment expands its remit to cover the whole world, and the gap between the body and technology grows increasingly blurry. Building always marks and measures space, equity, and possibility, but it's losing any clear-enough idea of how to perform as we race toward total urbanization on a planet at the point of asphyxiation.

Civilizations are marked by their priorities, and ours are too given over to prisons, malls, and McMansions and too little to good housing for all, complete and sustainable communities, green energy, rational mobility, structures of succor. Politics *programs* our architecture. The emblem of Trump's agenda is a



The Trump International Hotel and Tower in Chicago, designed by Adrian Smith when he was with SOM, opened in 2008.

piece of architecture—that absurd pharaonic wall he bruits for the Mexican border. His whole project trumpets *control*, and his mantra is shared by many an architect: just leave it to me!

Trump's sensibility is deeply old-fashioned: he makes buildings, *things*. Far scarier than tacky, grandiose building, however, is a spatial agenda being advanced by famously liberal Silicon Valley: the "smart" city. The phrase creeps me out. I worry that we're being sold a bill of goods by huge corporations looking to embed sensors in every sidewalk, window, and wall to create "responsive" environments in the name of unsnarling traffic, conserving energy, and keeping megacities going, but which will be used, at best, to continue compiling consumer and behavioral profiles to sell us stuff—and, at worst, to surveille every inch of the earth to call down

drone strikes on designated miscreants or raids by ICE on those 11 million "illegals," based on some biometric fantasy of alienness. Data are not neutral. Metadata can be the devil's work.

We—and our architecture—should be smarter than this, beginning with clearly knowing the limits of our intelligence and who it truly serves. As architectural practice becomes more and more technologized by CAD, BIM, scripting, and parametrics, our possibilities both expand and contract. Like so many other industries fleeing to cheaper pastures, architecture has let outsourcing become the norm. The economic impact is not clear-cut as a global matter (the free trade debate remains unsettled), but the

**Ours is not an autonomous discipline operating in a free field.**

homogenizing effects of single-supplier technology and the standardization of techniques and details augurs the worst effects of globalization—a world of oppressive sameness, in which we're duped by a fantasy of customization, of difference applied to buildings like tattoos, their screen-blinded inhabitants narcotized by Angry Birds.

I've just gotten back from China, always exhilarating and depressing. Thrilling for the massive scale of the construction of clean and spacious apartments and for the tentacles of glistening infrastructure that spread in all directions. Depressing for the monstrous homogeneity, the repression, the cut corners, the dumb worship of consumption, and the toxic environment (my asthma got so bad I had to come home early). While I was there, though, I was on a couple of panels with Patrik Schumacher, the Luther of parametricism, and we came to amiable blows. Avowing the medium to have become *the* universal style via a risible mock-Darwinian inevitability, his pitch is both heroic and vague. Heroic for its ardent *truthiness* but vague for its inability to truly distinguish his computational parameters from those that have informed architecture from that first primitive hut and—even more so—vague for the willful refusal to answer the question of just which values should set the process in motion. And this is the origin point of architecture's inescapable politics: whose parameters trump. ■

**DESIGNED IN EUROPE,  
MANUFACTURED IN THE U.S.A.  
INTRODUCING  
THE ASI ALPACO™ COLLECTION**



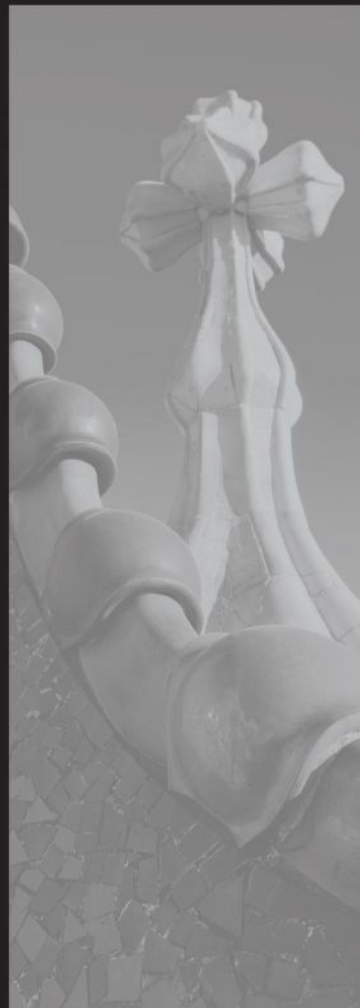
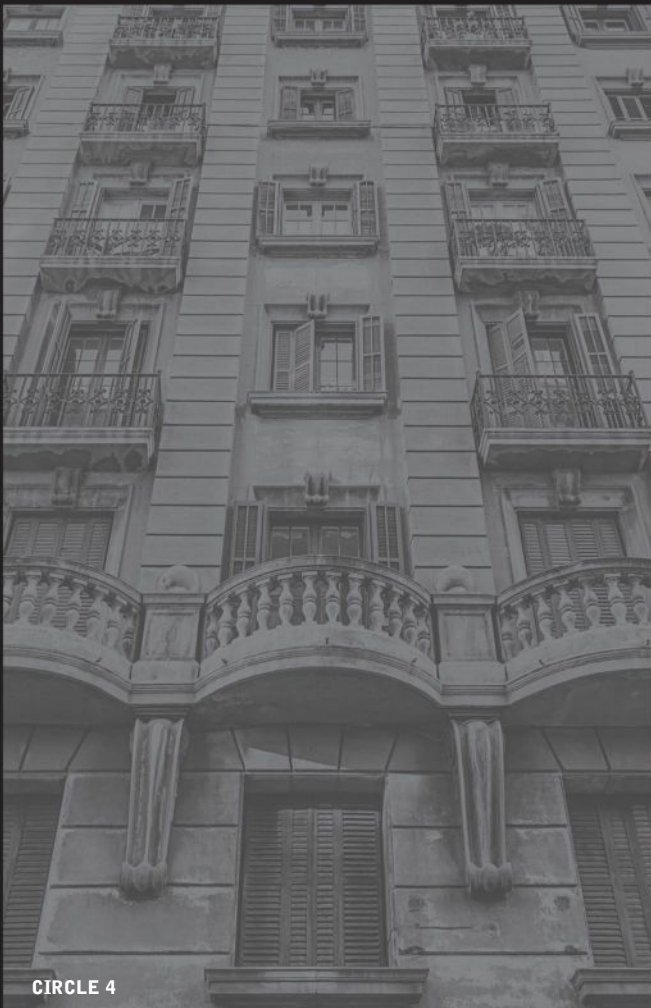
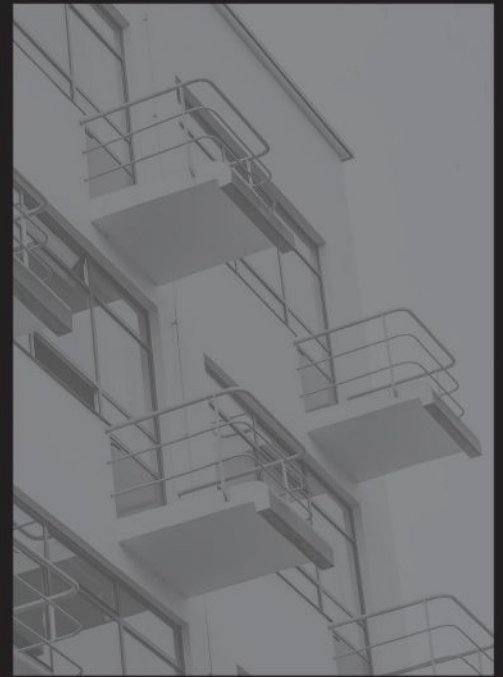
**Introducing the ASI Alpaco™ Collection**—a marriage of European design and engineering with the American manufacturing ingenuity you have come to expect from ASI—with the shortest lead times in the industry. The Collection is made from Phenolic and offers sleek hardware, robust construction and zero sightline doors and pilasters that meet in a flush finish with routed, overlapping closures for guaranteed privacy. And don't let Alpaco's looks fool you, the collection offers an exceptional value. **706.827.2700 • [asi-globalpartitions.com](http://asi-globalpartitions.com)**

**ASI**® *Global  
Partitions*

Congratulations to

**ARCHITECTURAL  
RECORD**

on **125 years**  
in print



We are proud  
to have been  
part of the  
journey since  
**1980**

**MOCKETT**

DOUG MOCKETT & COMPANY, INC.

Fine Architectural Hardware for Your *fine* Furniture®





## The World, As Seen by Denise Scott Brown

A photography exhibition on view at the Venice Architecture Biennale chronicles the architect's fascination with capturing the beauty and banality of cities.

BY ANNA FIXSEN

**IN THE POPULAR** imagination, Denise Scott Brown is immortalized in a single image from 1966: with the Las Vegas Strip in the distance, she strikes a defiant pose—hands on her hips with a smirk as wide as her stance.

"I was hamming," Scott Brown, 84, says of the photograph. "I learned from one of my professors at Penn that if you have passion, your students won't know it unless you ham your passion. You have to really put it on."

"It's been made into an emoji," she adds.

This photograph may encapsulate Scott Brown's cult status as both architectural and feminist icon, but it also alludes to her enduring relationship with photography. An exhibition on view

this fall as part of the Venice Architecture Biennale at the Palazzo Mora, designed and curated by Scott Brown, chronicles two formative decades in which she documented cities—from Venice, Italy, to Venice, California.

"I am not a photographer," Scott Brown writes in the exhibition text. "I shoot for architecture—if there's art here, it's a byproduct. Yet the images stand alone. Judge what you see."

The exhibition, called *Wayward Eye*, begins with Scott Brown's early expedi-

Scott Brown documented Las Vegas with the eye of both an urbanist and semiotician, capturing the city's hodgepodge of signs and architecture (above). Most iconic are her twin portraits of herself and her husband, Robert Venturi (middle and right, respectively).





The exhibition juxtaposes scenes from Venice, Italy, and Venice Beach, California. Scott Brown positioned an image of the Piazza San Marco (top) alongside a photo of beachside acrobats (above). “Both things are falling on you,” she says. “One is people, the other is pigeons.”

tions as an architect. This Grand Tour, as she calls it, started in 1956 with her first husband, Robert Scott Brown, while attending a summer school in Venice organized by the influential Congrès International d’Architecture Moderne. Armed with two Alpa cameras, three lenses, a hoard of color film, and a Modernist mindset, the pair set out to compile a visual log to bring back to their native South Africa.

Initially, they applied the Modernist principles they learned at architecture school to document the city and its classical structures. But they became captivated by the work of French street photographer Henri Cartier-Bresson and modern art. Through the young couple’s lenses, peeling posters became Braque paintings; windows echoed the rigid geometries of Mondrian. “We were still documenting and getting data, but it was a different kind of data,” Scott Brown says.

One of *Wayward Eye*’s preliminary images—composed by both Denise and Robert—depicts a man alone in Piazza San Marco being engulfed by a flock of pigeons, their pleated wings in razor-sharp focus. It is the exhibition’s sole black-and-white photo and, as a stand-alone object, one of the collection’s most compelling. But throughout the exhibition,

Scott Brown refuses to privilege one image over another: six smaller photographs abutting the black-and-white image depict acrobats on Venice Beach in California, tumbling through the sky—just like the Italian pigeons.

Scott Brown finds joy in these formal juxtapositions. In another sequence, the prows of Venetian gondolas mirror an image of vertical surfboards poking out of California sand. “The relationships are so important—one plus one is more than two,” Scott Brown says of the exhibition’s oversized collaged panels. She continues, “That’s urbanism: jamming them together and not studying them separately.”

Urbanism also informed *Wayward Eye*’s plan, which takes inspiration from Venice itself. Towering panels—teeming with images—are oriented around the gallery’s central space, an area Scott Brown refers to as the *campo*, or town square. Just off the *campo*, viewers enter the next decade of Scott Brown’s Grand Tour—the American Southwest. Shortly after Robert’s untimely death in 1959, Scott Brown left Penn to teach at the University of California, Berkeley, and later UCLA. “By the time I was in California, I was shooting like crazy,” she says. This time she focused on the hallmarks of the region’s arid automobile cities—vernacular buildings, car culture, neon signage, “Things that would shock you and open up your eyes and might make you aesthetically more sensitive,” Scott Brown says.

She took a special interest in Las Vegas, along with her second husband and architectural partner Robert Venturi, under the unlikely proposition, “Could Las Vegas be educational?”

One portion of the exhibition depicts an array of blazing signs lining the Las Vegas Strip, advertising casinos, bars, and hotels. Such urban portraiture laid the groundwork for her legendary studio course and book with Venturi and Steven Izenour, *Learning from Las Vegas*. She showed the slides to her students for years.

Another section of the show features sun-bleached daytime shots that seem to radiate the desert heat reflecting from freeways and car lots. Los Angeles is a tangle of telephone wires, while staid images of the Mojave Desert recall the vastness of Scott Brown’s first love—the South African veldt.

It is tempting to compare many of these images to those shot by Ed Ruscha in the early ’60s. But where Ruscha’s images of gas stations and swimming pools present a visual poker face, Scott Brown’s greet the viewer with a wink. A Las Vegas sign advertising “Termite Pest Control” is positioned adjacent to one that reads “Free Aspirin Ask Us Anything.” In another image—the photographic opposite of her own iconic Las Vegas portrait—she styled Venturi from the back à la Magritte, in a black suit, silhouetted against the Strip.

The Grand Tour never really ended for Scott Brown. Though she no longer travels, and an iPhone has replaced the old Alpa, her photographic approach remains unchanged. “You don’t think, you shoot,” she says. “Because by the time you’ve worked out with yourself why you want that thing, it’s gone. ■

125 YEARS

Congratulations to  
*Architectural Record*  
for 125 years of  
service to our industry.

Where do you hide a  
30" Expansion Joint Cover?

Anywhere you want to.

*Architect: Skidmore Owings and Merrill, LLP (SOM)*



At Oakland's Cathedral of Christ the Light, they are hidden in floors, walls, even in the courtyard. How? Our state-of-the-art seismic covers allow you to inset the surrounding finishes. Our joint covers can accept stone, metal, drywall and virtually any other material you can think of. So if you don't want to see the joint, call us at 1-888-621-3344 or visit [www.c-sgroup.com](http://www.c-sgroup.com).

**CS**™ Expansion Joint Covers

CIRCLE 232



Specify our new foam dispenser  
and save your clients... a ton.

**Bobrick's B-823 universal foam soap dispenser delivers up to \$1,000 savings *per sink, per year* vs proprietary cartridges.** The ADA-compliant model features architectural design with chrome finish and a 57% reduction in post-consumer waste. Plus it accommodates patrons' growing preference for a rich, lathery, hygienic hand-wash.



**BUILDING VALUE SINCE 1906**  
**BOBRICK.COM**

CIRCLE 217



© 2016 BOBRICK WASHROOM EQUIPMENT, INC.

## Double Take

Hou de Sousa's resourceful and flexible approach is propelling the firm into the spotlight.

BY DAVID SOKOL

IN 2007, Harvard GSD students Nancy Hou and Josh de Sousa decided to take their three-year relationship to the next level. The couple enjoyed supporting one another during their undergraduate coursework at Cornell and their first jobs, but they had not designed together until a Bjarke Ingels-led class challenged them to invent a new building type for Dubai. If

Hou and de Sousa today—both 34 and married for the past year—remember that proposal (a hybridized resort, desalination plant, and farm) with a chuckle, they remain grateful for the lesson in collaboration. “What we produced as a team was better than what we could do separately,” de Sousa says.

So there was no hesitation in 2010 to launch a studio in Ecuador, where Hou's restaurateur parents requested creative direction for a new spot called Dim Sum Bar. Although stably employed in recession-era New York—de Sousa at Joel Sanders Architect and Hou at Stephanie Goto—they packed their bags for Quito.

Hou says of Dim Sum Bar, “We had to work with a lot of existing conditions,” among them prepurchased chairs, a minefield of structural columns, and her father's mandate “that it has to feel like a Chinese restaurant.” Following the local custom of design-build delivery,

they also served as general contractor on the project. They found solutions that overcame the multiple limitations—a series of partitions provide organizational logic, accommodate a local preference for private dining, and evoke traditional Chinese doors, for example. Hou de Sousa also used CNC fabrication to create the screens, and then painted the perforations to spell out the restaurant name.

Hou's parents then tapped the designers for their next restaurant, Happy Panda. The architects continued their design explorations by digitizing the 12th-century Chinese scroll painting *Qingming Shanghe Tu* to make wallpaper and shaping the ceiling into an inverted pagoda with CNC-cut plywood and muslin. “It was a completely new education in construction and materiality,” de Sousa says of the two projects.

Dim Sum Bar and Happy Panda transformed a single trip into three years of steady business with other clients, but New York proved irresistible, and Hou de Sousa resettled there in late 2013. Residential renovations paid the bills initially and, in time, competitions presented a creative outlet as well as a marketing channel for the couple, who otherwise blanch at self-promotion.

Submitting proposals paid off almost immediately. For the Folly Program and City of Dreams contests conducted in 2015 for New York's Socrates Sculpture Park and Governors Island, respectively, Hou de Sousa earned shortlist positions by repurposing plastic shopping bags as skins for temporary pavilions. In the span of one week this spring, the studio triumphed in another pair of competitions. *Raise/Raze* reassembled several hundred thousand plastic balls—first used in a ball pit installation at the National Building Museum last year—into a



This summer, Hou de Sousa (left) won a competition to repurpose plastic balls for an installation in a former trolley station (above) in Washington, D.C. Their first projects, Dim Sum Bar (bottom, left) and Happy Panda restaurant (bottom, right), are in Ecuador.

modular block system inside a former trolley station in Washington, D.C. And this year's Folly Program victory, on display through December, attaches a lumber space frame to a shipping container already on-site. Scrap material salvaged from the Socrates property rests within the exposed structure like shingles.

Hou and de Sousa attribute their recent achievements to their attention to constructability and budget—lessons learned in Quito, which are being applied to three Manhattan apartments currently at or near completion. The partners also conjecture that the participatory nature of their designs helped secure their recent wins: for *Raise/Raze*, visitors could reconfigure the plastic modules into whatever seating or sculpture they imagined, and the Socrates installation serves purposes ranging from shelving to shelter from the elements. “Right now, we think that flexible, interactive systems can help architecture remain relevant in an accelerating world,” de Sousa says. Functioning more as systems than objects, the projects, he says, “mute our own voices and pass the microphone to the public.” ■



—ANNIVERSARY—

# RECORD ON THE ROAD

ARCHITECTURAL  
RECORD 125 years



## SAVE THE DATE

NOVEMBER 14, 2016

UNIVERSITY OF SOUTHERN CALIFORNIA | LOS ANGELES, CA

This special anniversary edition of Record on the Road will take place at recently renovated Harris Hall at the USC School of Architecture. The evening will be highlighted by a panel discussion featuring leaders in the field of design discussing their latest projects and the trends they see shaping the future of architecture, and attendees can **earn up to two CEUs**.

The November 14th symposium will be moderated by *Architectural Record* editor-in-chief Cathleen McGuigan and will include her thoughts on global trends in design.

Our program begins at the end of the workday and will include sponsored continuing education presentations, offering a total of **TWO CEUs for the entire event**. The program will be followed by a celebratory networking cocktail reception in the adjacent courtyard. Come celebrate 125 years of *Architectural Record* and learn and earn at the same time.

REGISTER TODAY AND GET YOUR CREDITS IN FOR 2016!

PRESENTING SPONSORS

CEILINGS  
PLUS®

SageGlass®

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

PLASTIC LAMINATE **MOISTURE GUARD™**



Moisture Guard™ Edge Banding: Available on all partition doors, panels, pilasters and urinal screens in 45 colors.

# PLASTIC LAMINATE WITH AN ELEGANT EDGE

Introducing the new Plastic Laminate Partitions with Moisture Guard™ Edge Banding. Our Moisture Guard™ Edge Banding fuses with the substrate creating a seamless beveled profile that eliminates any unsightly black lines that appear in standard Plastic Laminate.

ASTM tests on Moisture Guard™ Edge Banding confirms 3X greater durability with increased resistance to moisture and humidity than standard Plastic Laminate. Available in 45 colors/patterns and our new Easy Stall Shoe\* speeds up the installation process.

Our Plastic Laminate with Moisture Guard™ Edge Banding is now backed with an industry leading exclusive five-year warranty. To see a sample, contact 708.442.6800 and ask to meet a sales representative.

*\*Floor Anchored/Overhead Braced Only.*

## **NEW**

Plastic Laminate  
Moisture Guard™

Standard  
Plastic Laminate

**ASI**® *Accurate  
Partitions*



## THIS ROOM THEIR INSPIRATION

Designers: **Beth Dotolo and Carolina Gentry**

**DXV** tapped the celebrated expertise of **Beth Dotolo and Carolina Gentry** to reimagine the iconic city of **Palm Springs** in the **Modern Movement**.

*"When you think about Palm Springs, you don't just think about architecture. You think about lifestyle."*

— **Beth Dotolo**

**Mid-Century Resort** Mid-century was probably the peak of Palm Springs glamour. But we wanted someone to come in and envision themselves in it today as well. So we incorporated design elements that were modern, fresh and unique, and paired them with glamorous touches throughout.

The angular lines of the Seagram® Freestanding Soaking Tub made it a dynamic focal point for our design. Behind it lies the tropical indoor/outdoor shower, a refreshing expression of desert modernism. Bright whites, bursts of colors and organic patterns are all set off by a few rich hits of quirky fun, setting the tone for a true sense of leisure that's as timeless today as it was yesterday.

For more on Beth and Carolina's room, visit us online at [dxv.com](http://dxv.com)



AMERICAN STANDARD

## The Cult of Destruction

### Obsolescence: An Architectural History

By **Daniel M. Abramson**. University of Chicago Press, February 2016, 208 pages, \$35.

Reviewed by **Aleksandr Bierig**

**WHILE ALL BUILDINGS** are subject to the decay and ruin brought by time, historian Daniel Abramson is concerned in this book with a different culprit: obsolescence, or the process of becoming "obsolete." In his analysis, this term refers to structures demolished for having outmoded mechanical systems, or insufficient rentable space, or a suddenly unappealing stylistic expression, among many other factors. Such buildings might have survived were it not for shifting economic standards, desires, or tastes. Abramson's overriding concern—as in much of his previous work—is how architecture functions within capitalism, a system which operates by "creative destruction," as economic historian Joseph Schumpeter first phrased it in 1942. This relentless transformation, Abramson argues, is at odds with a core principle of Western architecture: solidity.

The opening chapter concerns the term obsolescence itself, which emerged during the era of whirlwind office-building speculation in early 20th-century Chicago and New York. Perhaps the most spectacular example was Manhattan's 20-story Gillender building, demolished in 1910 after a mere 13-year existence. It was replaced by a larger and more profitable structure—a process then becoming widespread in major city centers. Interest groups, like the National Association of Building Owners and Managers (NABOM), began producing reports to track the rapid destruction of buildings in such overheated real-estate climates and lobbying the government to recognize the new pressures that beset investors. By 1931, amendments to the Federal tax code allowed building owners to write off the age of their properties as a function of an obsolescence that had come to seem inevitable. Because the new rules favored building owners, their underlying logic was never again challenged.

Meanwhile, the application of "obsolescence" began expanding. A 1951 planning commission judged Boston's entire East End neighborhood "obsolete" due to perceived deficiencies in its housing stock. This decision, however, relied less on strictly economic standards than on

politically motivated concerns. Though the effect was the same—clearing space for new development—its causes were different. If obsolescence happened to office buildings in New York and Chicago because of a volatile real-estate market, it was applied to Boston's East End by opportunistic politicians.

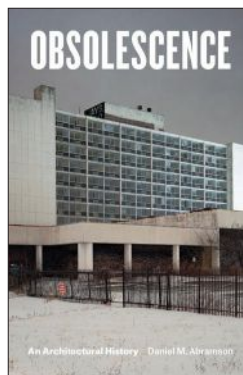
In the second half of the book, Abramson moves away from precise case studies toward a vast reinterpretation of 20th-century architectural history. After World War II, he argues, the fear of obsolescence created an anxiety that haunted practically all of architectural thinking in the developed world. Flexible space is a central theme, identified in many different forms: the well-known exhibition hall projects of Mies van der Rohe, as well as designs for expandable hospital complexes, or even visionary projects like Archigram's Plug-in City. In Abramson's reading, each of these attempts to plan for future change were, in fact, defensive measures set against

constantly changing needs leading to premature destruction. Such schemes revealed a profession newly apprehensive about the longevity of its built work.

The final chapter turns to contemporary trends in reuse, preservation, and sustainable design. If we follow recent emphasis on these themes, obsolescence has now itself become obsolete, in favor of a new ethos of durability. But by Abramson's own analysis, such a position is at distinct cross-purposes with the engine of economic growth that remains at the center of capitalist society. To grow is still to displace existing material with new material, to encourage obsolescence.

Perhaps we have to look beyond economics. Obsolescence throughout the 20th century was not only an economic problem but a material one—predicated on the assumption of abundance—that destruction might always be followed by redevelopment. Even if the loudest voices today refer to "sustainability," the very way we fill space in contemporary society, from air-conditioning systems to urban sprawl, relies upon the continuation of almost limitless energy use for what are often the most banal daily activities. Without addressing these larger and most insidious problems, we now threaten ourselves with an entirely new kind of obsolescence. ■

*Aleksandr Bierig is a Ph.D. student at Harvard University.*





DXV presents the Seagram® Freestanding Tub and Contemporary Floor Mount Tub Filler.



A TIME.  
A PLACE.  
A MOVEMENT.

**Palm Springs** Reimagine the Modern Movement.  
Discover the entire luxurious collection  
of bathroom products at [dxv.com](http://dxv.com).

This DXV bathroom was designed by **Beth Dotolo and Carolina Gentry**.



CLASSIC

GOLDEN ERA

AMERICAN STANDARD

MODERN

CONTEMPORARY

CIRCLE 142



## FORMAWALL® INSULATED METAL VERTICAL JOINT THE NEXT CHAPTER IN INNOVATION

Introducing a joint venture in art and engineering. Formawall® Insulated Metal Vertical (IMV) Joint is the new standard in CENTRIA Formawall insulated metal panel systems. The Formawall IMV joint enhances the exterior aesthetic by replacing traditional exposed gaskets at end joints with metal joinery while providing an improved thermal barrier at the end joint.

*Discover the next chapter in innovation at*  
[CENTRIperformance.com/IMV](https://CENTRIperformance.com/IMV)  
To learn more call 1.800.250.8675

  
**CENTRIA**  
REIMAGINE **METAL**

## Gown and Town

**Pedagogy and Place: 100 Years of Architecture Education at Yale**, by Robert A.M. Stern and Jimmy Stamp. Yale University Press, May 2016, 668 pages, \$100.

Reviewed by James Gauer

IF YOU WANT TO KNOW the history of the Yale School of Architecture, you'd be hard pressed to ask anyone more knowledgeable than Robert A.M. Stern, its dean from 1998 until this past July. Published to mark the 100th anniversary of the first class to graduate from Yale's professional program in 1916, *Pedagogy and Place* is a tribute from the erudite and prolific author to his alma mater and academic home for the last 18 years. Written in collaboration with Jimmy Stamp, whose witty musings on architecture have appeared in *The Guardian*, *Smithsonian*, and *Wired*, its 668 pages make it a weighty tome. Fortunately the weight is leavened, despite the pedantic title, by unexpectedly lively text and carefully curated archival images. Given the visual nature of the subject, it's disappointing there aren't more.

Organized in 10 chronological chapters, *Pedagogy* begins with an account of Yale's early attempts to emulate the Ecole des Beaux Arts. Subsequent chapters describe the surprisingly slow shift to Bauhaus-inspired modernism, then to Brutalism, Postmodernism, and all that has followed, including a downward slide in the school's reputation prior to Stern's arrival as dean.

The extensively researched narrative includes stories of both the school and the people who shaped it. The star-studded roster of deans, professors, studio critics, and students includes Raymond Hood, George Howe, Eero Saarinen, Paul Rudolph, Louis Kahn, Vincent Scully, Richard Rogers, Norman Foster, Charles Gwathmey, Charles Moore, Zaha Hadid, and Deborah Berke (the new dean of the architecture school), to mention just a few.

The chapters spanning the '60s are especially noteworthy. "A Time of Heroics, 1958–1965" chronicles Rudolph's contributions as professor and chairman, as well as architect of the controversial Art & Architecture Building. "Architecture or Revolution, 1965–1971" describes Moore's iconoclastic reaction to Rudolph's formalism. Among the more entertaining passages is an account of Moore's attempt to de-emphasize Yale's traditional ties to New York where, he complained, "the profession was addicted to glamour . . . the New York offices would come recruiting at Yale . . . and I would say 'Don't you go to Pratt and to

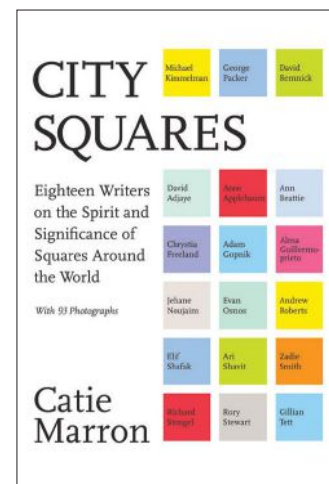
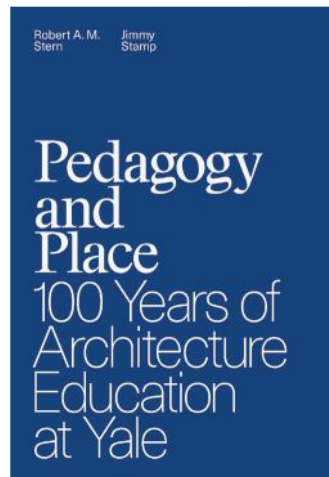
Cooper Union and to schools around New York?' and they would say, 'We get our draughtsmen from there. We come to Yale for our future partners.'"

In the final chapter, Stern reflects candidly on his years as dean. He remembers the disdain—from modernists who feared he might turn Yale into a bastion of historicism—that initially greeted his appointment, but the success of his tenure has largely silenced his critics. He sidestepped the style wars by assembling a faculty that mixed cutting-edge practitioners like Frank Gehry, Peter Eisenman, and Greg Lynn with classically minded colleagues such as Leon Krier and Demetri Porphyrios. He also put the school on firm financial footing, renovated the derelict A&A Building, upgraded the quality of both students and teachers, and established a curriculum that stresses fundamental principles, thereby giving Yale's previously tarnished reputation an impressive new luster. It's a noble legacy.

**City Squares: Eighteen Writers on the Spirit and Significance of Squares Around the World**, by Catie Marron. Harper Collins, April 2016, 375 pages, \$32.50.

Catie Marron, chairman of the board at Friends of the High Line in New York, has collected 18 thoughtful essays on urban squares to follow her previous book, *City Parks: Public Places, Private Thoughts* (2013). Prominent writers such as Ann Beattie, Adam Gopnik, and Zadie Smith, along with other contributors such as architect David Adjaye and filmmaker Jehane Noujaim, reflect on the meaning and character of some of the world's most beloved and distinguished public places. Each is illustrated by evocative color photographs, many in lush two-page, full-bleed spreads.

This seductive hardcover anthology is nicely organized in three thematic sections: "Culture," introduced by *New York Times* architecture critic Michael Kimmelman;



"Geopolitics," by *New Yorker* editor David Remnick; and "History," by *New Yorker* staff writer and National Book Award winner George Packer. Their keen observations alone would make the book worth reading.

In some of the most engaging essays, personal history intersects with metropolitan history. Adam Gopnik recounts both the evolution of Paris's Place des Vosges and his memories living there with his family, having crepes and omelets at Ma Bourgogne, the café frequented by the fictional detective Maigret. Zadie Smith offers a bittersweet recollection of her time in Rome, bracketed by self-consciousness as a tourist in Piazza Della Madonna Dei Monti and trauma as a resident whose apartment in Piazza Sforza Cesarini was destroyed by fire. Alma Guillermoprieto, who grew up in Mexico City, contrasts a childhood memory of Christmas in the Zócalo, which seemed "infinite in its sweep and grandeur," with a more recent Yuletide visit when she found the plaza's

historic splendor obscured by an enormous and incongruous ice-skating rink.

As the only architect among the authors, David Adjaye's contribution is of particular interest. With an eye to dispelling Western myths and stereotypes about Africa and to reconciling modernity with indigenous culture, he recalls a pilgrimage to the Djemma el-Fnaa, the "bustling heart" of Marrakesh, and offers this insight: "Space only becomes truly public when people recognize it and utilize it as such. Great public space cannot be built as much as curated."

Readers looking for in-depth information on architecture and planning may be disappointed, but that's not really the point of *City Squares*. It is instead a celebration of these quintessential outdoor rooms as civic settings for the rituals and dramas of urban life. ■

James Gauer, an architect and author based in Victoria, B.C.; Chicago; and San Miguel de Allende, Mexico, contributes regularly to RECORD. He received his M.Arch. from Columbia University.

Reprinted from *THE ARCHITECTURAL RECORD*, Issue of September, 1926



*First Christian Church,  
Breckenridge, Texas  
Clyde Woodruff, Architect  
West & Womack, Builders*

## For Permanent and Colorful Exteriors —Brick's the Thing

This splendid edifice is faced with our Acme Weatherproof Face Brick, selected by Architect and approved by the Building Committee for color, texture and adaptability. Refreshing old ivory tones maintain the atmosphere of the architect's design. ¶ We specially manufacture correct tints and textures—weatherproof quality—for Mission, Italian, Spanish and Correlated Architectural Types. Write for our eight-page folder entitled "Permanent and Colorful Exteriors." ¶ Use brick, the material everlasting.

### *Plants—Owned and Operated*

Bennetts and Denton,  
Texas; Cleveland,  
Oklahoma City and  
Tulsa, Oklahoma;  
Fort Smith, Little  
Rock, Malvern, Perla,  
and Pine Bluff Ar-  
kansas.



## Acme Brick Company

*Manufacturers of the Products we Sell*

# ACME BRICK

### OFFICES AND DISPLAY ROOMS:

Ablene, Texas  
Amarillo, Texas  
Beaumont, Texas  
Corsicana, Texas

Dallas, Texas  
Ferris, Texas  
Fort Smith, Ark.  
Fort Worth, Texas

Galveston, Texas  
Houston, Texas  
Lake Charles, La.  
Little Rock, Ark.

Memphis, Tenn.  
New Orleans, La.  
Oklahoma City, Okla.  
Port Arthur, Texas

San Antonio, Texas  
Shreveport, La.  
Tulsa, Okla.  
Waco, Texas  
Wichita Falls, Texas

THIRTY-FIVE YEARS IN THE ART OF BRICKMAKING

First Christian Church, Breckenridge, Texas May 15, 2016



## For Permanent and Colorful Exteriors — Brick's “Still” the Thing



Breckenridge's First Christian Church has been protected by an Acme Brick exterior for 90 years. In 1926 the church's building committee and architect Clyde Woodruff chose genuine Acme Brick to keep their new church “everlastingly beautiful” and maintenance free. Not only have these brick retained their rich color, but thanks to natural weathering, they are even lovelier today than the day the cornerstone was laid.

Like First Christian Church, the many thousands of commercial and civic structures built with Acme Brick over the last 125 years continue to withstand the test of time, decade after decade – beautifully.

For your next project, consider the lasting beauty, design flexibility and hard-fired integrity of Acme Brick. For the showroom or distributor nearest you, please visit [www.brick.com](http://www.brick.com) or call 1-800-792-1234.

Acme Company extends its congratulations to Architectural Record - which, like Acme, is also celebrating 125 years of service to the architectural and building community.



From the Earth, For the Earth™

# ONE LIGHT

## DIVISION 5 METALS

Railing, Guardrails, Windscreens, Spider Fittings, Cladding, Column Covers, Sun Control Systems

## DIVISION 8 OPENINGS

Entrances, Storefronts, Curtain Walls, Windows, Window Walls, Commercial Hardware, Door Controls, Bi-Folding Walls

## DIVISION 10 INTERIORS

Interior Office Partitions, Frameless Shower Doors, Stacking Partitions, Demountable Walls

## GLASS & GLAZING

Products, Tools, and Supplies to Get the Job Done Right

# COMPLEX PROJECTS, SIMPLIFIED.

SINGLE-SOURCE GLAZING SOLUTIONS TO MEET THE SPEC AND SCHEDULE FOR MULTIPLE SCOPES ACROSS MULTIFAMILY CONSTRUCTION

**CRL-U.S. Aluminum** is the leading single-source manufacturer and supplier of architectural glazing systems. Our vast product portfolio—coupled with a strategic distribution network—gives us complete control over quality and lead time that translates into absolute peace of mind for those who specify, install, operate, or occupy.



E-mail: [usalum@crlaurence.com](mailto:usalum@crlaurence.com)  
Phone: (800) 262-5151 Ext. 5305  
Fax: (866) 262-3299  
Web: [crl-arch.com](http://crl-arch.com)

**Project:** ONE LIGHT  
**Location:** Kansas City, MO  
**Architect:** Humphreys & Partners  
**Systems:** Series TT601 Unit-Glaze Window Wall and Series 900 Terrace Doors

SPECIFY CONFIDENTLY. SPECIFY CRL-U.S. ALUMINUM.

CIRCLE 241



### Infuse

These composite deck boards with a wood-grain finish and 95% recycled content absorb up to 35% less heat than conventional capped composites. The three lengths of nominal boards and coordinating fascia boards may be installed on the ground, in the ground, or underwater. They are also slip-, scratch-, stain-, and fade-resistant.

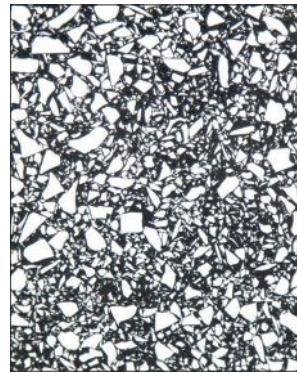
[moistureshield.com](http://moistureshield.com)

CIRCLE 100

## All in the Family

Opt for housing solutions that reduce energy use, increase durability, and accelerate construction schedules.

By Julie Taraska



### Etchings

This modern take on Midcentury Terrazzo features shards of ultracompact Dekton surfacing cast into slabs of Silestone natural quartz. Available in two colors (ink, shown), the stain-resistant Etchings can be specified in three thicknesses and six edge formats.

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

CIRCLE 101



### dECOleather

Scraps reclaimed from shoes, car seats, and tanneries supply 70% of the fibers in this recycled-leather veneer.

Available in three textures and 18 colors, dECOleather arrives in 4' x 8' sheets and can be used on interior surfaces, walls, and furniture. Crocodile pattern in casino royal, shown.

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

CIRCLE 102



### Oldcastle SurePods

An alternative to traditional bathroom construction, these modular units (shown in the Prospect Plaza housing project in Brooklyn, New York) consolidate electrical, plumbing, and finishing work into one prefabricated product. The highly customizable bathrooms are designed using 3-D modeling software and can contribute to LEED certification.

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

CIRCLE 104

### Gemstone

These recyclable concrete roof tiles achieve a Class A fire rating and can withstand winds up to 150 mph. Available in four profiles and six Southwest-inspired hues, including Barcelona in bronze pearl blend (shown), they are compliant with the California Title 24 energy standards and can contribute to LEED certification.

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

CIRCLE 103



# ARCHITECTURAL RECORD **COCKTAIL NAPKIN** SKETCH CONTEST 2016

2 GRAND PRIZE  
WINNERS  
WILL RECEIVE AN

**APPLE  
WATCH  
SPORT!**

## CALL FOR ENTRIES

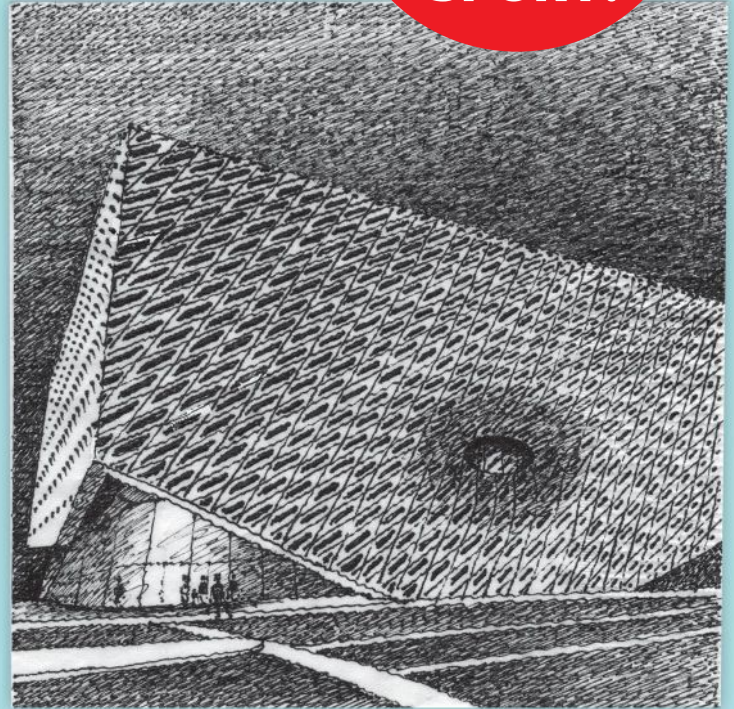
If you are a licensed architect or related professional who practices in the United States, you can enter this remarkable contest.

All you need is a white cocktail napkin and pen to demonstrate that the art of the sketch is still alive. Two grand prize winners will be chosen (1 licensed architect, 1 related professional). Grand prize winners will receive an Apple Watch Sport and a box of cocktail napkins with their winning sketch printed on it!

The sketches of the winners and runners-up will be published in the November 2016 of *Architectural Record* and shown online in the ArchitecturalRecord.com Cocktail Napkin Sketch Gallery.

## HOW TO ENTER:

- ▶ Sketches should be architecture-oriented and drawn specifically for this competition.
- ▶ Create a sketch on a 5-inch-by-5-inch white paper cocktail napkin.
- ▶ Use ink or ballpoint pen.
- ▶ Include the registration form below or from the website.
- ▶ You may submit up to 6 cocktail napkin sketches, but each one should be numbered on the back and include your name.
- ▶ All materials must be postmarked no later than September 9, 2016.



"The Broad Veil on Grand" by Daniel Sauerbrey, 2015 runner-up

**DEADLINE: September 9, 2016. ENTER NOW!**

For more information and official rules visit: [architecturalrecord.com/cocktail-napkin-sketch-contest](http://architecturalrecord.com/cocktail-napkin-sketch-contest)

ARCHITECTURAL  
RECORD 125 years

Founding sponsor



SEND ALL SUBMISSIONS  
IN ONE ENVELOPE TO:

Cocktail Napkin Sketch Contest  
*Architectural Record*  
350 5th Avenue, Suite 6000  
New York, NY 10118

For more information,  
email: [ARCallforEntries@bnpmedia.com](mailto:ARCallforEntries@bnpmedia.com)  
with the subject line "Cocktail Napkin"

NAME OF ARCHITECT

FIRM

ADDRESS

NUMBER OF YEARS IN PRACTICE

TELEPHONE

EMAIL

What is your job function? (check one)

ARCHITECT

DESIGNER

FACILITIES MANAGER

SPECIFICATION WRITER

CONTRACTOR

OTHER

Are you registered?

YES  NO

Are you an AIA member?

YES  NO



# ONLY ASI CAN SUPPLY EVERYTHING FOR YOUR WASHROOM

(EVERYTHING BUT THE WASHROOM SINK)



Welcome to the new ASI—the world's leading manufacturer of commercial partitions, washroom accessories and lockers. So what makes ASI so unique? Only ASI designs, engineers and manufactures fully-integrated solutions. So all of our products work together seamlessly. Welcome to choice, welcome to innovations, welcome to the new ASI. For more information, call 917.476.9000 or visit: [asigroup.us](http://asigroup.us)

**ASI**®  
Group  
Partitions · Accessories · Lockers



You can count on EnergyShield<sup>®</sup> Continuous Wall Insulation products. With thirty years of industry expertise in polyiso manufacturing, Atlas is your partner for every stage of your build. Let's talk about technical solutions for you, today.

- BEFORE YOUR BUILD**

As an industry leader in facer technology, Atlas EnergyShield<sup>®</sup> offers the industry's widest product range and solutions for every project type.

---

- DURING YOUR BUILD**

We keep costs and stress down. Our unrivaled supply chain reduces the inefficiencies of product shortages.

---

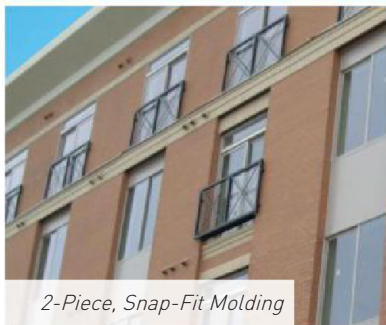
- AFTER YOUR BUILD**

We deliver confidence. Our EnergyShield<sup>®</sup> Continuous Wall Insulation products have proven and lasting thermal management performance.

GO BEYOND THE PANEL...

...AND GO TO THE NEXT LEVEL.

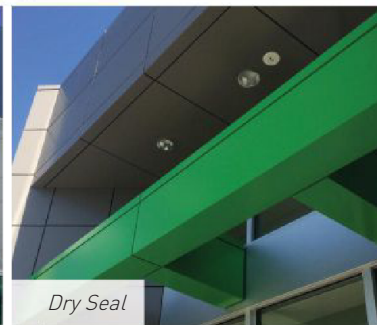
1-Piece, Tight-Fit Molding



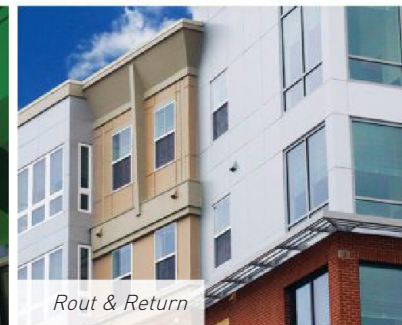
2-Piece, Snap-Fit Molding



Clip & Caulk™



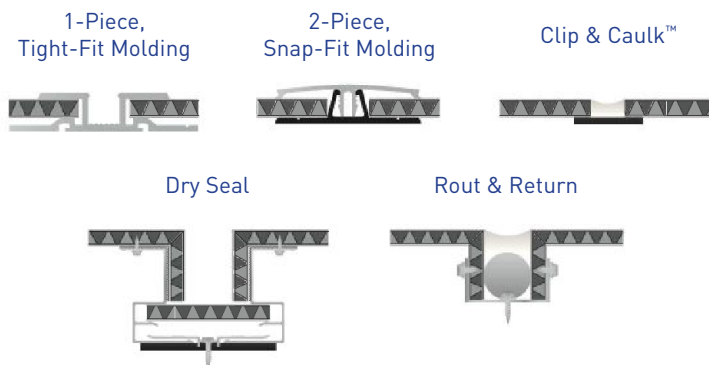
Dry Seal



Rout & Return

## Omega-Lite® ACM Panel Systems

Laminators Incorporated does more than manufacture today's premier ACM panels—we provide engineering assistance, custom fabrication, tested installation systems, and all associated support services.



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

See how we can take your ACM project to the next level.

CIRCLE 137

OMEGA PANEL PRODUCTS Ω  
**LAMINATORS INC.**

800.523.2347





Crush™ PANEL ©2015 modularArts, Inc. U.S.



Stella™ PANEL ©2015 modularArts, Inc. U.S.



Dune™ PANEL ©2003 modularArts, Inc. U.S.



Linen™ PANEL ©2015 modularArts, Inc. U.S.

**InterlockingRock**™ wall panels align to create seamless, sculptural wall surfaces of any size. Add drama and intrigue to any space, with durable, lightweight, natural gypsum.

modulararts®

[www.modulararts.com](http://www.modulararts.com)

[info@modulararts.com](mailto:info@modulararts.com)

206-788-4210

made in the USA

CIRCLE 8

A NEW SPIN ON VINYL




SETTING A NEW STANDARD IN VINYL FOLDING DOORS L

[ACANTINADOORS.COM](http://ACANTINADOORS.COM)

CIRCLE 77

 **LaCANTINA DOORS**  
OPEN SPACES®



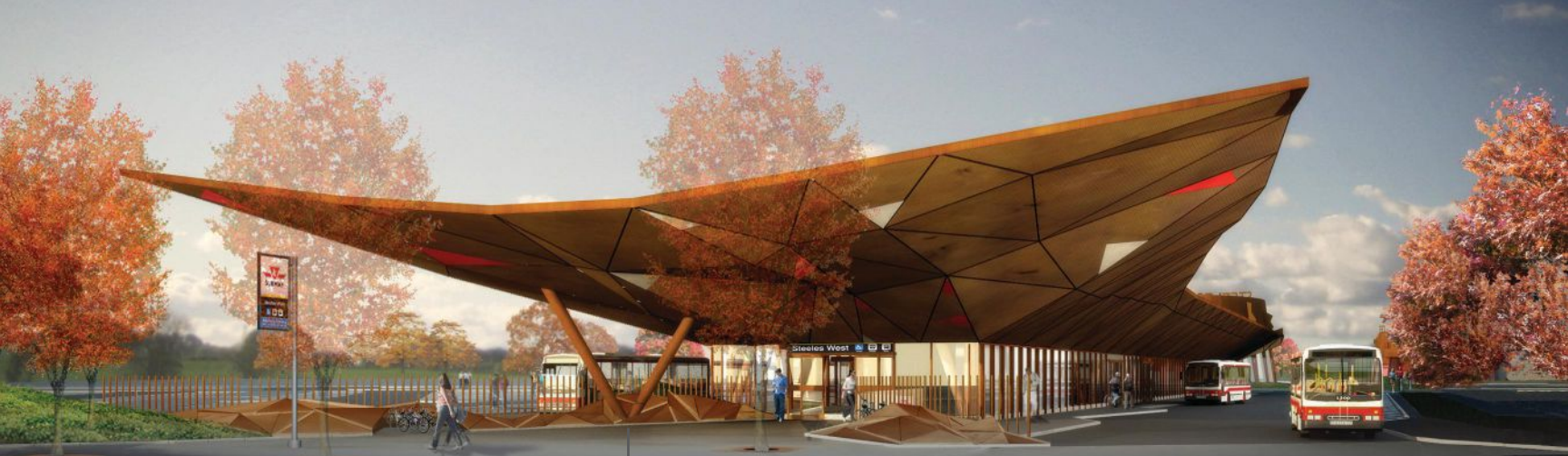
You have experience.  
You have talent.  
But do you have Yadira?

Yadira Hernandez  
Sub-Zero and Wolf  
Trade Rep  
Northeast Region

An expert in Sub-Zero and Wolf products and showroom resources, your local trade rep is your partner in design, your key to smoother projects and a more successful business. To find yours, contact your local showroom. [subzero-wolf.com/traderep](http://subzero-wolf.com/traderep)



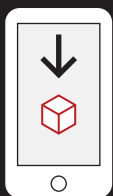
SHOWROOM



SGA / IBI Group Architects in joint venture with Will Alsop  
Cast node photograph: Dieter Janssen



Experience this design in *Augmented Reality*



Download the free  
Augment app



Fill screen with this ad  
& scan with Augment



If you could make  
structural steel take any shape,  
what would you have it do?

CIRCLE 183

**CASTCONEX**  
innovative components for inspired designs



*Because*  
**YOUR VISION  
COMES  
FIRST**



Product for Every Project / 3rd-Party Certifications / Expert Architectural Representatives  
The World Leader in Paint & Coatings / Available At More Than 2,400 Locations Nationwide

Visit [ppgpaints.com](http://ppgpaints.com) to start making your vision come to life.

CIRCLE 255

© 2015 PPG Industries, Inc. All Rights Reserved.  
PPG PAINTS™ is a trademark of PPG Industries Ohio, Inc.  
*Because Every Job Matters* is a registered trademark  
of PPG Architectural Finishes, Inc.



BECAUSE EVERY JOB MATTERS™





YOU **CREATE** IT.  
WE **BUILD** IT.

Introducing new **BIMCreate™** and **CABCreate™** design tools from Otis

As the world's largest manufacturer and maintainer of people-moving products, Otis has long been the easy choice for millions of customers around the world. By placing new innovative design tools at your fingertips, we're making the decision that much easier.

Both tools are simple ways to see exactly why Otis makes sense in your building – even before it's built. [Check them out at Otis.com.](http://Otis.com)

## BIMCreate™

Enables architects to create customizable, configured 3D Revit® files for integration into overall building plans, rather than selecting from pre-existing files

## CABCreate™

Allows architects, building owners and general contractors to design their own elevator aesthetic package and view highly sophisticated, realistic renderings



EPICVUE™  
CONTEMPORARY COLLECTION

## Privacy is overrated.

Every project presents an opportunity for greatness. JELD-WEN® windows and doors enable you to bring your vision to life exactly as you imagined. Choose from an unrivaled array of styles, colors and hardware that add to performance, along with a warranty that we stand behind with conviction.

[jeld-wen.com](http://jeld-wen.com)

© 2016 JELD-WEN, inc.

CIRCLE 229

 **JELD-WEN**  
WINDOWS & DOORS



Christ Hospital Joint & Spine Center, Cincinnati, OH (by SOM and the Office of James Burnett)

**When you need help at the intersection of landscape and architecture, you need Tournesol Siteworks.**

As the country's largest manufacturer of commercial lightweight pots and planters, we have the engineering and product management team to turn your vision into something more. For this hospital project, we saved tens of thousands of dollars by reducing production time by four weeks, and allowed the cranes to come down early.

**Find more about our range of rooftop solutions at [tournesolsiteworks.com](https://tournesolsiteworks.com).**



**BETWEEN** LANDSCAPE  
+ ARCHITECTURE

[tournesolsiteworks.com](https://tournesolsiteworks.com) | 800-542-2282

CIRCLE 237

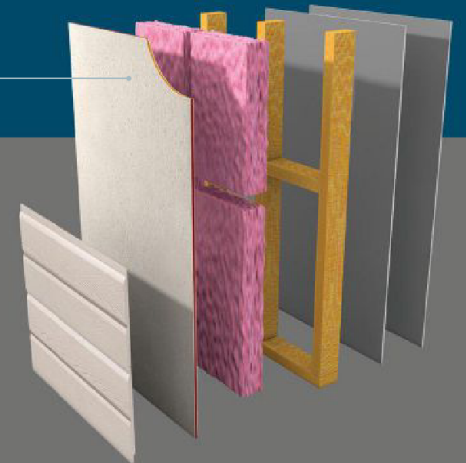


Image courtesy of KTG, Inc.

# Don't Let Your Walls Become Barriers.

Introducing a single panel that will allow you to do more with less.

2-SIDED LP® FLAMEBLOCK®  
IN EXTERIOR ASSEMBLY  
UL DESIGN NO. U349



LP® FlameBlock® Fire-Rated OSB Sheathing gives you the freedom to design a more efficient wall.

- ICC-certified (ESR 1365) fire-rated OSB sheathing
- Code-compliant for a variety of different 1-hour and 2-hour fire-rated assemblies
- Reduces labor costs and construction time
- Carries design values for load/span and shear that are superior to fire-retardant treated wood structural panels of the same thickness
- Classified as an Exposure 1 weather-resistant material

Another benefit is that you eliminate the need for an extra layer of gypsum, speeding construction time and reducing material and labor costs. Choose LP FlameBlock sheathing on your next design and start doing more with less.

**LP** **FLAMEBLOCK®**  
BUILDING PRODUCTS FIRE-RATED OSB SHEATHING

CIRCLE 73

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

© 2016 Louisiana-Pacific Corporation. All rights reserved. All trademarks are owned by Louisiana-Pacific Corporation.

See how LP FlameBlock sheathing can help you do more  
at [LPCorp.com/FlameBlock](http://LPCorp.com/FlameBlock)

BUILD WITH US®



We protect and beautify the world™

Premier Products.  
Premier Partners.  
Proven History.



Main Image: INFOMART • Dallas, TX • 1985 | Inset Image: Maple Pine Hardwood Floors

## The PPG CERTIFIED APPLICATOR PROGRAM<sup>SM</sup>. Traditionally for Metal. Now for Hardwood.

For decades, architects have trusted DURANAR<sup>®</sup> fluoropolymer coatings, expertly applied by members of the *PPG Certified Applicator Program (CAP)*, to protect and beautify aluminum building components on landmark building projects. Now they can do the same with hardwood floors finished by the first PPG CAP program member certified to apply DURETHANE<sup>®</sup> wood coatings.

For the first time, architects can specify custom-colored, prefinished hardwood floors for office buildings, restaurants, hotels and retail stores with the same confidence they reserve for *Duranar* metal coatings applied by traditional PPG CAP program members.

Whether your goal is to add warmth and color to a building's interior or exterior, PPG can connect you with a certified applicator trained and audited to deliver the world-class customer service, industry-leading technical expertise and accelerated product delivery your project demands.

To learn more, visit [ppgideascales.com](http://ppgideascales.com) or call 1-888-PPG-IDEA.

### CIRCLE 208

Duranar, Durathane and the PPG Logo are registered trademarks, PPG IdeaScapes and We protect and beautify the world are trademarks and The PPG CAP Certified Applicator Program and design are servicemarks of PPG Industries Ohio, Inc.

## METAL COATINGS

### Architectural Window

Rutherford, NJ • (201) 939-2200  
[architecturalwindow.com](http://architecturalwindow.com)

### Astro Shapes

Struthers, OH • (330) 755-1414  
[astroshapes.com](http://astroshapes.com)

### Durapaint Industries, Ltd.

Scarborough, ON • (416) 754-3664  
[durapaint.net](http://durapaint.net)

### Kawneer Co., Inc.

Bloomsburg, PA • (570) 784-8000  
Cranberry Twp., PA • (724) 776-7000  
Lethbridge, AB • (403) 320-7755  
Springdale, AR • (479) 756-2740  
Visalia, CA • (559) 651-4000  
[kawneer.com](http://kawneer.com)

### Keymark Corporation

Fonda, NY • (518) 853-3421  
Lakeland, FL • (863) 858-5500  
[keymarkcorp.com](http://keymarkcorp.com)

### Sapa Extrusions Americas

Gainesville, GA • (770) 355-1560  
Mississauga, ON • (905) 890-8821  
Pointe Claire, QC • (514) 697-5120  
Portland, OR • (503) 285-0404  
Yankton, SD • (605) 665-6063  
[sapagroup.com](http://sapagroup.com)

### Spectrum Metal Finishing, Inc.

Youngstown, OH • (330) 758-8358  
[spectrummetal.com](http://spectrummetal.com)

### Trojan Architectural Coaters

Pompano Beach, FL • (954) 366-5319  
[trojanpowder.com](http://trojanpowder.com)

### Tecnoglass S.A.

Barranquilla, Colombia • 57-5-373-4000  
[tecnoglass.com](http://tecnoglass.com)

### Windsor Metal Finishing, Inc.

Kissimmee, FL • (407) 932-0008  
[1stchoicewindsor.com](http://1stchoicewindsor.com)

### YKK AP America Inc.

Austell, GA • (678) 838-6000  
[ykkap.com](http://ykkap.com)

## HARDWOOD COATINGS

### Somerset Hardwood Flooring

Somerset, KY • (877) 404-9663  
[somersetfloors.com](http://somersetfloors.com)

# ENGINEERED TRIMS

## SYSTEM SOLUTIONS ENGINEERED FOR SUCCESS

Fry Reglet's comprehensive line of precision Fiber Cement Trims provide the perfect accent for today's contemporary building designs. Fabricated from extruded aluminum, the trims are durable, easy to install and aesthetically pleasing. Trims are engineered to accommodate all types of quality fiber cement panels and applications.

Specify Fry Reglet Today.

FURNITURE | LIGHTING | BATH | OUTDOOR | HARDWARE | KITCHEN & DINING

ATGSTORES.COM  
PRO SERVICES

CIRCLE 30

DELIVERING  
ELITE SERVICE  
AND DESIGN  
SINCE 1999.

CALL 1 (800) 801-2021 OR EMAIL [PROACCOUNTS@ATGSTORES.COM](mailto:PROACCOUNTS@ATGSTORES.COM) FOR  
DEDICATED ACCOUNT REPRESENTATIVES • FREE SHIPPING • WEEKEND SUPPORT • TRADE DISCOUNTS



# *The Next Step To Effortless Design*



PROTECTION THAT LIVES ON  
**MICROBAN**

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

**SEQUENCE HDP**   
High Definition Porcelain®

BY

**floridatile**

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



# FRAXION

## PERFORMANCE AND BEAUTY. SMARTS AND SCIENCE.

Introducing Fraxion™ downlights. Discover the most innovative features, advanced engineering, and sleekest design sensibility to meet the needs and dreams of architects and designers. Enjoy exceptional adjustability, punchy angles and smooth transitions for beam to field. The shallowest housing family on the market, at just about 2" for fixed and wallwash and just over 3" for adjustable, IC and NIC, available with all driver types. Ball plungers, field changeable optics and a new complete family of fixtures give you more ways to make space come alive. Fraxion — everything you've ever wanted, and a few welcome surprises, in a single fixture. PATENT PENDING.

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

CIRCLE 159



4.25" ID

SHALLOW 2.1" HOUSING

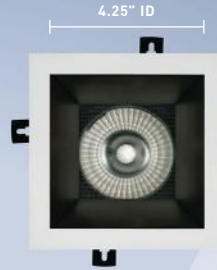
2.5°



0.07

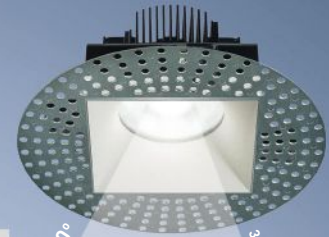


PROPRIETARY OPTICS. UTILIZE TIR, REFLECTION AND REFRACTION TO CAPTURE 100% OF THE LIGHT



4.25" ID

UP TO 2200 DELIVERED LUMENS



60°

3 FLANGE OPTIONS. KNIFE EDGE TRIMLESS, MICROFLANGE, OR STANDARD. MAX. 60°F



UNIQUE SLIDING PIVOT POINT AIM FOR NO CLIPPING OF 15° BEAM UP TO 40° ADJUSTMENT



15°

**LUCIFER**  
LIGHTING COMPANY

Stavros Niarchos Foundation Cultural Center | Athens | Renzo Piano Building Workshop

# Hitting a High Note

The gift of a splendid complex and public park creates an oasis for the Greek people in austere times.

BY VICTORIA NEWHOUSE



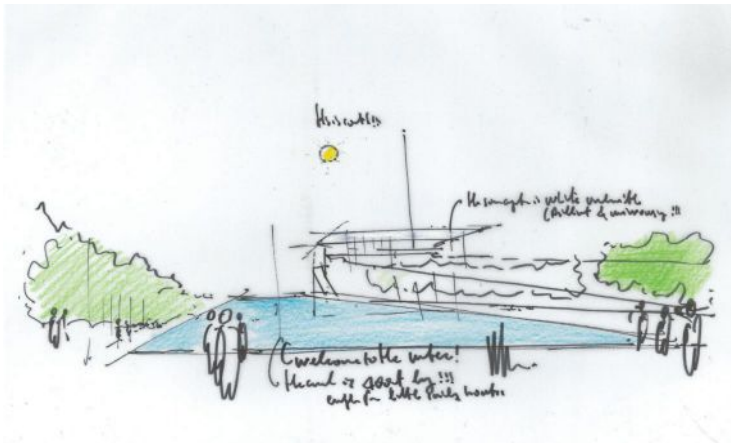
Experimentation with forms, materials, and means of sustainability has been a constant throughout Renzo Piano's career. For the Stavros Niarchos Foundation Cultural Center (SNFCC) in Athens, he pushed the envelope of all three, and the result is a stunning hilltop complex that includes an opera house, a new home for the National Library of Greece, and a 42-acre park.

The building is composed of two large volumes, separated by a spacious open-air agora, that sit on a structure of reinforced concrete with some steel elements. All of this is embedded in a 100-foot-high man-made hill, which provides dramatic views of the sea and the city. Piano, who was chosen in 2008, replaced the master plan by Cooper Robertson, which had left the site flat, with his own scheme, literally bringing a new dimension to the project. The architect referenced the near-

#### SHINE ON

The opera house (left) and the National Library (right) are separated by a spacious agora and bounded by a 1,300-foot-long reflecting canal.





by mountains and their marble quarries in creating the artificial hill, and then excavated it deeply to insert the structure.

The official opening awaits the library's transfer of its fabulous collection, which, in addition to nearly 2 million books and periodicals, includes 9th- and 10th-century parchment manuscripts as well as the 13th-century one that was the first in the Byzantine and Mediterranean world to replace parchment with paper. In the meantime, completion of construction was celebrated in June with four days of free festivities that attracted 115,000 people. The event provided a brief respite from the six years of painful austerity suffered by Greece in order to qualify for the \$300 billion bailout by the European Union. The festival's title, *Metamorphosis: the SNFCC to the World*, reflects the conviction of Andreas Dracopoulos, copresident and director of the Stavros Niarchos Foundation (SNF)—which made the prodigious gift to Greece—that the new complex symbolizes the nation's transformative capabilities.

The cultural center is in the middle-class Kallithea neighborhood, just two miles south of the Acropolis and only a few hundred feet from scenic Faliro Bay. Except for the opera and some library services, the



**BY THE SEA** Close to a bay and to the 2004 Olympic Stadium, the complex (above and right) has a green roof that can be reached by steps. An early Piano sketch shows the primacy of the canal as a unifying element (top).







facility will be open to the public gratis. Among its public amenities is a new 42-acre park with a large lawn that can be used for art installations, and nine playgrounds, designed by Deborah Nevins & Associates of New York; it features drought-resistant Mediterranean vegetation and covers most of the site, climbing up the hill and onto the library's green roof.

Signaling the complex's presence—and clearly visible from the surroundings—is a huge but seemingly weightless 107,600-square-foot white canopy, tapered like an airplane wing, which floats above the opera house. Created with Expedition Engineering, the British firm that also executed the seismically resistant structure, it is made of ferro-cement, a thin shell of reinforced mortar over a layer of metal mesh and closely spaced steel rods. Low wages in Greece and generous funds from the SNF enabled the fabrication of this material, ruled out

in any significant quantity in developed countries since the 1950s because of its labor intensity. The canopy not only supplies shade but also supports solar panels (one of many factors behind the project's targeted LEED Platinum designation, which would be a first in Greece).

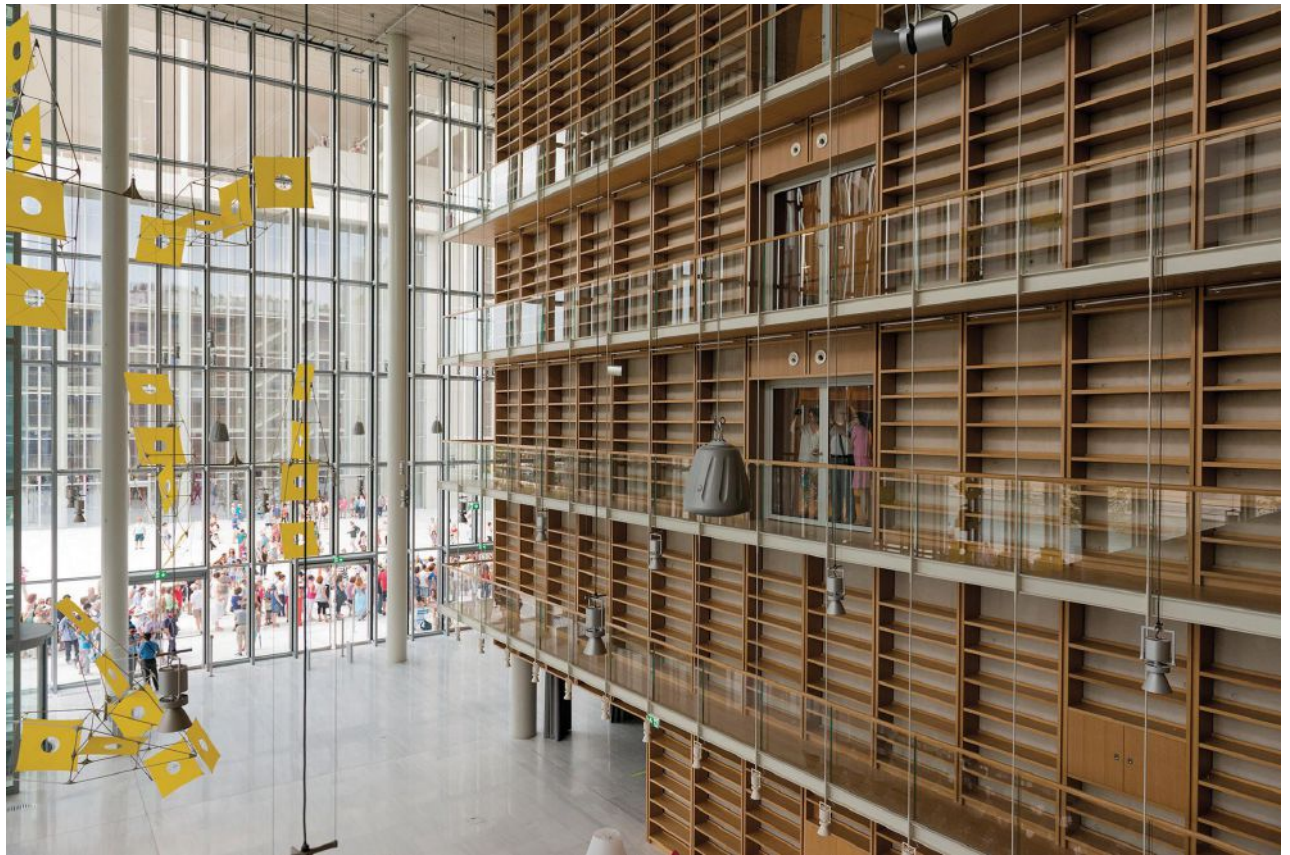
Below the canopy on the opera house roof, a vast, outdoor terrace is the most spectacular of the complex's numerous public spaces. Accessed by two dedicated glass elevators as well as by an uphill path through the park, this high point offers panoramic views of the sea, the Acropolis, and the surrounding city, while capturing welcome breezes. At ground level, a 1,300-foot-long, 100-foot-wide canal reinforces the relationship with the sea. Seeming to extend to infinity, the ribbon of water reflects the entire length of the complex and visually ties together its components. Beside the channel, a broad promenade, lined with plane trees, leads to the agora.



#### SHOW TIME

The elegant 1,400-seat horseshoe-shaped auditorium can be acoustically adjusted with specialized curtains (above). The lobbies of the opera house (right) and library, with its currently empty shelves (top, right), signal their respective functions through the glass-fin walls surrounding the agora. The hanging mobiles are by Susumu Shingu.

PHOTOGRAPHY: © GEORGE DIMITRAKOPOULOUS/SNFCC (OPPOSITE); YIORGIS YEROLYMBOS/SNFCC (TOP); SHUNJI ISHIDA/RPBW (BOTTOM)

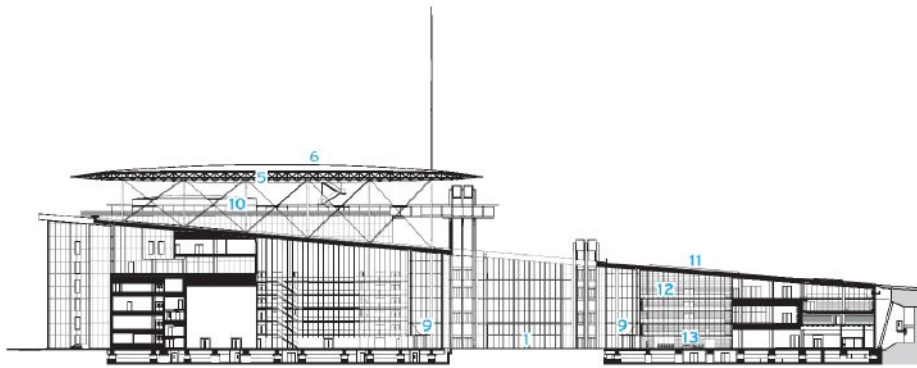


From the agora, looking into the towering, clear-glass-fin walls, the program within each wing is visible: broad balconies identify the opera house and multiple levels of bookshelves call out the library. The 80-foot-high, narrow opera house lobby (with a box office, coat room, and bar) bustled with crowds during the June festivities. The flawless poured-in-place concrete of the walls here and the perfect alignment of the marble floor slabs are among many examples of the extraordinarily high quality of workmanship throughout the complex.

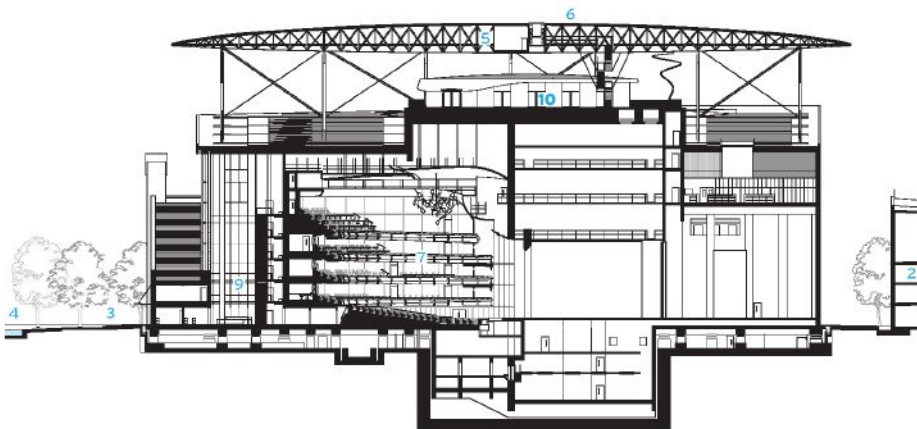
Across the agora from the opera house is a public lending library, combined for the first time with the scholarly National Library. Each has generous spaces, many filled with natural light. Numerous colorful seating arrangements invite social exchange and visitors with laptops. However, with little tradition of library usage in Greece, these expansive spaces may initially exceed demand.

In the entranceways to both wings, balconies suspended from the ceiling are fabricated in the same materials: white-painted steel, glass balustrades, and oak handrails, floors, and ceilings. Animating both lofty spaces are brightly colored paper mobiles by the Japanese artist Susumu Shingu and “Perroquet” aluminum light fixtures by Renzo Piano Building Workshop (RPBW), which are white at the opera, and gray at the library.

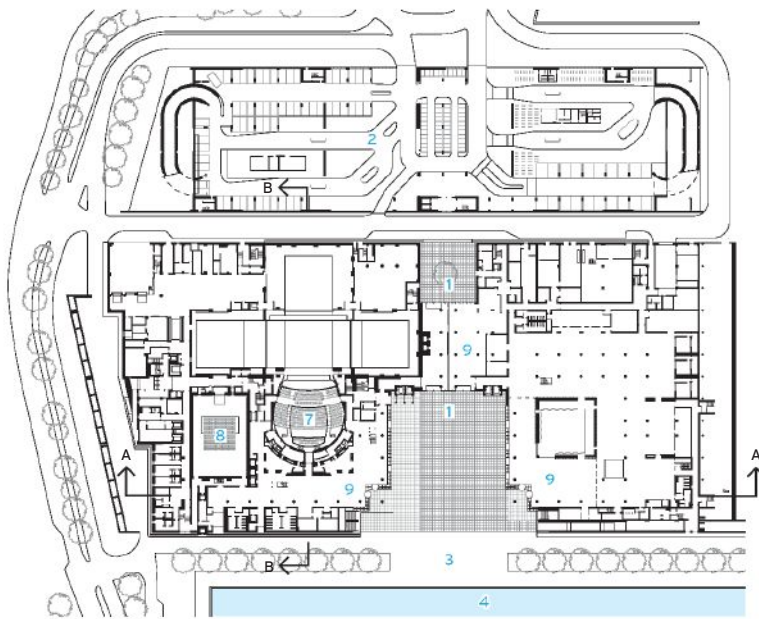
In the opera house, the lobby’s informality gives way to the plush elegance of a traditional 1,400 seat auditorium. The curved walls are clad in deep-red-stained anigré veneer, and balcony fronts are natural American cherry; seats sport a brighter red fabric. (There is also a more modern-looking 450-seat experimental theater located at the southern side



SECTION A - A

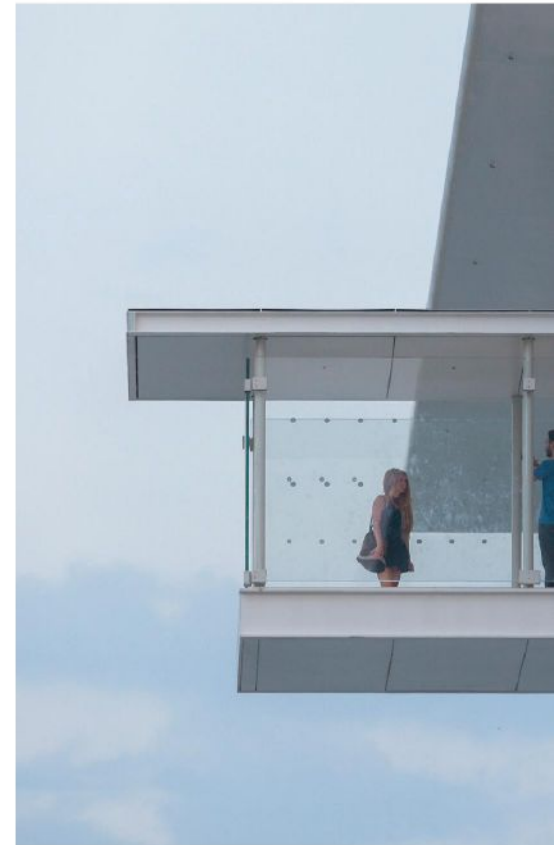


SECTION B - B



OVERALL PLAN - AGORA LEVEL

- 1 AGORA
- 2 PARKING
- 3 PROMENADE
- 4 CANAL
- 5 FERRO-CEMENT CANOPY
- 6 PHOTOVOLTAIC ARRAY
- 7 OPERA AUDITORIUM
- 8 EXPERIMENTAL THEATER
- 9 LOBBIES
- 10 THE "LIGHTHOUSE"
- 11 GREEN ROOF PARK
- 12 RESEARCH LIBRARY
- 13 PUBLIC LIBRARY



**A PIAZZA WITH A VIEW**

The opera house roof under a ferro-cement canopy (opposite, top) offers spectacular views of the city and the Acropolis, while a glazed viewing space (above) cantilevers above the complex. The four-day public opening in June (right) drew 115,000 people.

PHOTOGRAPHY: COURTESY SNFCC (TOP); © YIORGIS YEROLYMBOS/SNFCC (OPPOSITE, BOTTOM)









#### MEDITERRANEAN GARDEN

The 42-acre park, the largest in Athens, features native plants and slopes gently upward to cover the library with a green roof. It is targeted to be the first LEED Platinum project in Greece.

of the main auditorium.) Judging by a recent performance with piano accompaniment of Cella Costea's "Vissi d'Arte" from Tosca, the theater's acoustics are excellent. RPBW's first opera house design promises to be a smashing success.

In 2007, the SNF responded to the Greek government's call for a new home for the opera and the National Library by promising to assume all design and construction costs, which totaled nearly \$842 million. In 2009, despite the nation's worsening financial situation, the foundation confirmed its commitment with the understanding that, when completed, the complex would be handed over to the Greek government, which would own and run it (at an annual cost at present of approximately \$40 million). Now, eight administrations later, with the possibility that the government may be unable to assume this financial responsibility, the SNF might temporarily pick up the tab. In addition to the SNFCC's aesthetic and practical merits, it is undoubtedly an inspiring symbol of belief in the future of Greece. ■

*Victoria Newhouse's Chaos and Culture: RPBW Creates the SNFCC in Athens will be published by the Monacelli Press in May 2017.*

#### credits

**ARCHITECT:** Renzo Piano Building Workshop, in collaboration with Betaplan (Athens) – G.Bianchi, partner in charge; V. Laffineur, associate in charge, design team

**ENGINEERS:** Expedition Engineering/OMETE (structural); Arup/LDK Consultants (m/e/p, sustainability, acoustics, lighting, security, IT); Theater Project Consultants (theater equipment); Front (facade)

**CONSULTANTS:** Deborah Nevins & Associates/H.Pangalou (landscaping); C&G Partners, M. Harlé/J. Cottencin (signage); Faithful+Gould (project and cost management)

**GENERAL CONTRACTOR:** Salini Impregilo Terna

**CLIENT:** Stavros Niarchos Foundation

**SIZE:** 950,000 square feet (building)

**COST:** \$842 million

**COMPLETION DATE:** June 2016

#### SOURCES

**CONCRETE:** ET Beton, Lafarge

**METAL/GLASS CURTAIN WALL, PARTITIONS:** Unifor, Tosoni

**GLASS:** Saint-Gobain, AGC, Guardian

**SKYLIGHTS:** Schüco

**LIGHTING:** Zumtobel, Artemide, Luceplan, iGuzzini, ERCO, Bright, Ares, SILL Lighting, Bruck Lighting, ETAP Lighting, Reggiani, Luxo



LEFT TO RIGHT: DESIGNER DOOR HARDWARE WITH SPICE LEATHER AND UJ LEVER, MACK DOOR HARDWARE WITH MACK KNOB, AND PROVENGE PULL



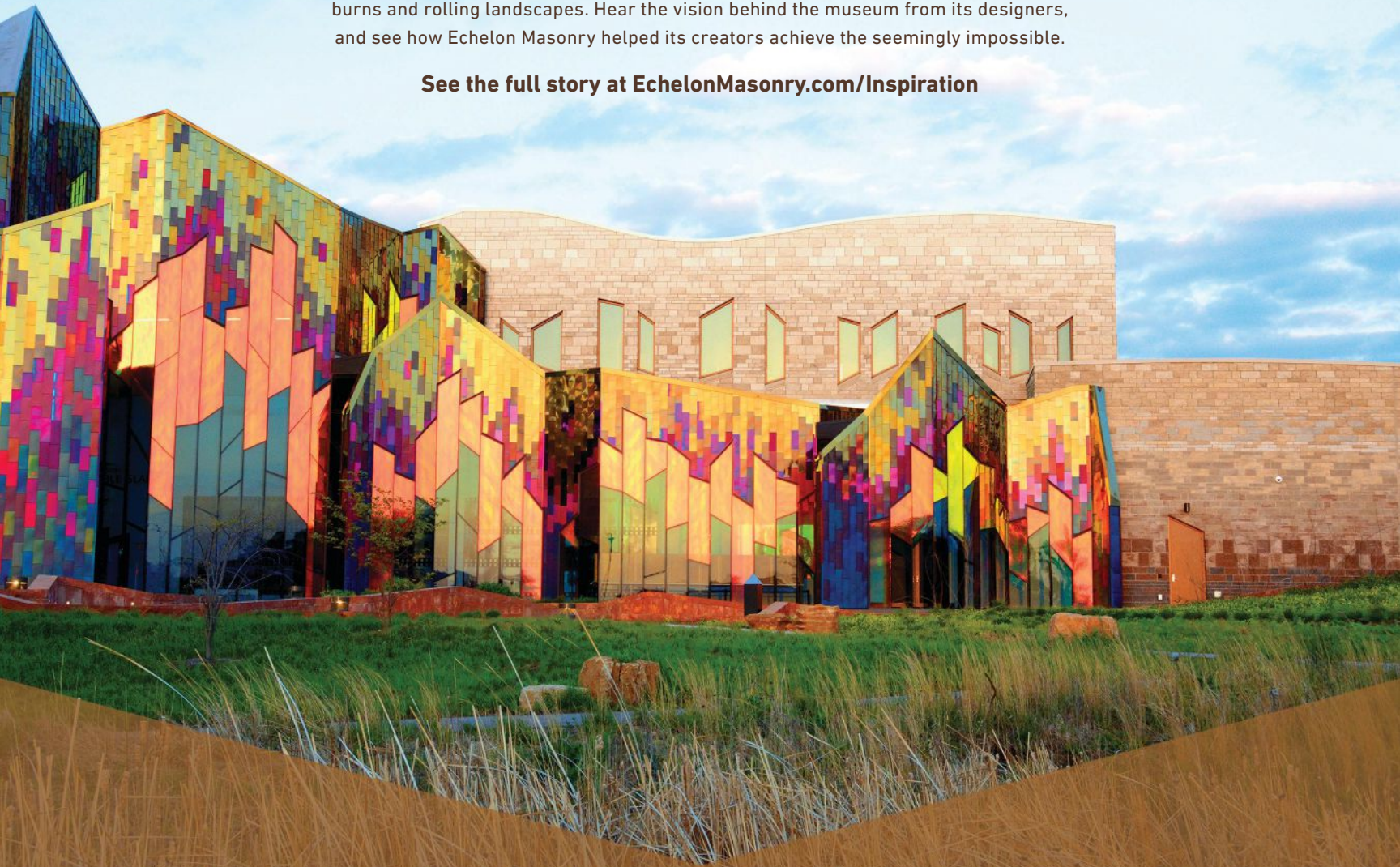
ECHELON™

# IDEAS IGNITE

with the next generation of masonry

The Museum at Prairiefire honors the region's most prominent features—its prairie fire burns and rolling landscapes. Hear the vision behind the museum from its designers, and see how Echelon Masonry helped its creators achieve the seemingly impossible.

**See the full story at [EchelonMasonry.com/Inspiration](http://EchelonMasonry.com/Inspiration)**



#### PRODUCTS USED

Artisan Masonry Veneers® Cordova Stone | Kansas Limestone | Dichroic Glass

MASONRY PRODUCTS FROM

 **Oldcastle** Architectural

© 2016 Oldcastle. Echelon is a registered trademark of Oldcastle. Oldcastle Architectural is a registered trademark of Oldcastle. All rights reserved. ECH16-037

CIRCLE 236

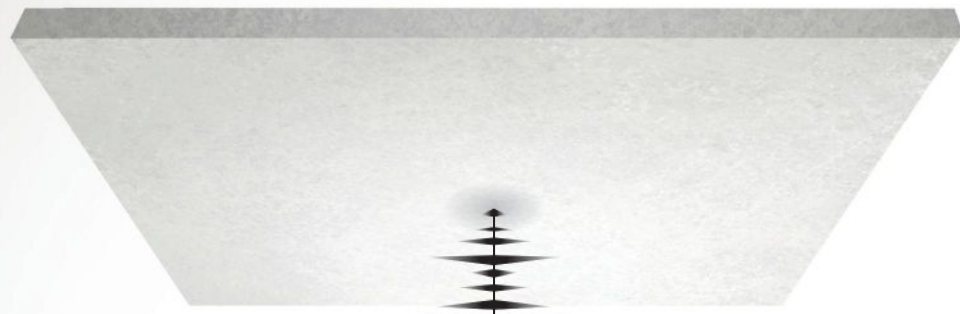




National Terrazzo & Mosaic Association  
www.NTMA.com  
800.323.9736  
**CIRCLE 186**



An NTMA contractor has the training, skill, and experience to understand that their job is a part of the big picture—bringing your job to a successful completion.



The Coffee Gulper

The Apple Cruncher

The Ear-Splitting Cackler

The Constant Gabber

The Loud Talker

The Door Slammer

The Weighty Walker

The Heavy Sigher

## Good acoustic design starts with a high absorption rating.

There's a lot of noise out there about ceiling panels. Get the facts at [OptimizedAcoustics.com](http://OptimizedAcoustics.com)

CIRCLE 32



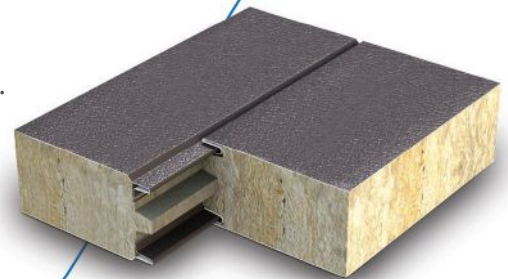
INSULATED  
METAL  
PANELS

# PROTECT YOUR PROPERTY AGAINST THE SPREAD OF FIRE

ThermalSafe®

The ThermalSafe insulated metal panel combines advanced design with Metl-Span's sophisticated manufacturing expertise to create a composite, fire-rated panel. With a core made from non-combustible structural mineral wool boards, ThermalSafe provides superior structural characteristics and span capability.

*For more information please call  
877.648.7522 or visit [metlspan.com/ar](http://metlspan.com/ar)*





125 YEARS  
Congratulations to  
*Architectural Record*  
for 125 years of  
service to our industry.

# COOL FOR SCHOOL

## Get educated on Construction Specialties Sun Control systems

Construction Specialties' Sunshades and Daylight Systems have been used on a range of educational facilities with diverse performance needs, meeting the ample daylight requirements of student centers and the energy challenges of large medical training centers.

But no matter the school or subject, our sun control systems always look cool, featuring a wide variety of blades, outriggers, fascias, and even custom designs and LED lighting.

Download product cheat sheets and learn more by visiting  
[c-sgroup.com/sun-controls](http://c-sgroup.com/sun-controls) or calling 800.631.7379

 **Sun Controls**



# Celebrating 125 Years

## LOOKING BACK

In the 125 years since ARCHITECTURAL RECORD's inception, radical changes have indelibly shaped not only the built world but also the culture of the discipline and the personality of the magazine. In the following pages, our editors take stock of what has passed: we single out 125 of the top buildings constructed during the span of RECORD's existence (both the celebrated and the lesser known); we present leading architects' reflections on projects that have influenced their own work; we commemorate structures that were demolished; and we highlight critics whose voices have sharpened the magazine's perspective. With these special features, we chronicle our history and pay tribute to architecture's ongoing evolution.

# Record's Top 125 Buildings

A selection of the most significant works that defined architecture in our era.

To commemorate ARCHITECTURAL RECORD's 125th anniversary, our editors have chosen to honor 125 of the most important works of architecture built since the magazine's founding in 1891. This was not an easy task. We started by polling a group of distinguished critics and scholars for nominations, but the final list is ours. While many inclusions are obvious, others may be surprising, or a little controversial—as are some omissions. And, we know, all 125 might not make the list at RECORD's next big birthday: time inevitably changes not only our tastes, but how we understand history.



**1891**  
**Wainwright Building**  
St. Louis  
Adler & Sullivan



**1899**  
**Glasgow School of Art**  
Glasgow  
Charles Rennie Mackintosh



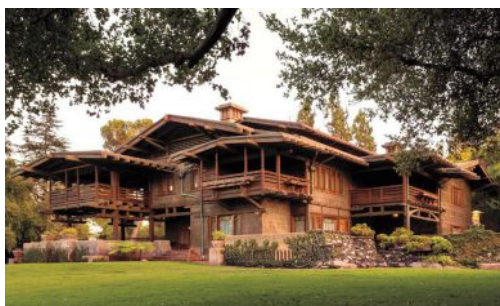
**1906**  
**Larkin Building**  
Buffalo  
Frank Lloyd Wright



**1906**  
**Morgan Library & Museum**  
New York  
McKim, Mead & White



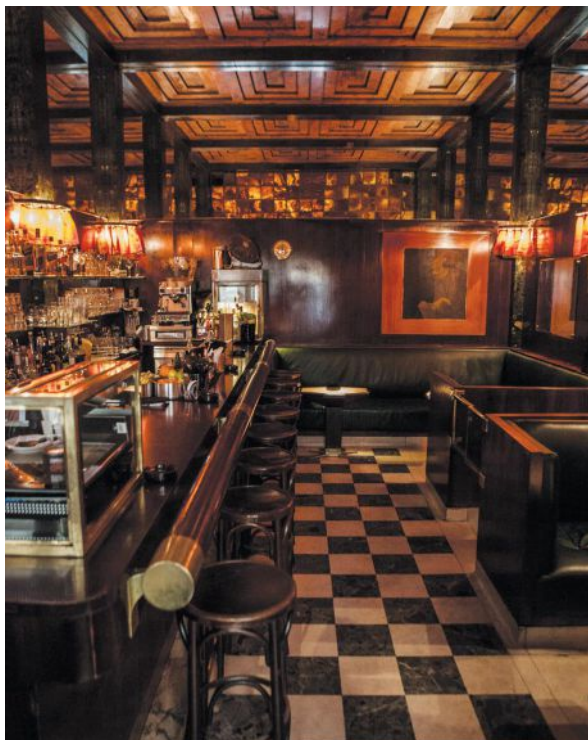
**1906**  
**Austrian Postal Savings Bank**  
Vienna  
Otto Wagner



**1908**  
**Gamble House**  
Pasadena, California  
Greene & Greene



**1908**  
**Unity Temple**  
Oak Park, Illinois  
Frank Lloyd Wright



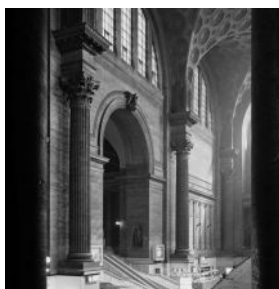
**1909**  
**Kärntner Bar**  
Vienna  
Adolf Loos



**1910**  
**AEG Turbine Factory**  
Berlin  
Peter Behrens



**1910**  
**First Church of Christ, Scientist**  
Berkeley, California  
Bernard Ralph Maybeck



**1910**  
**Pennsylvania Station**  
New York  
McKim, Mead & White



**1910**  
**Robie House**  
Chicago  
Frank Lloyd Wright

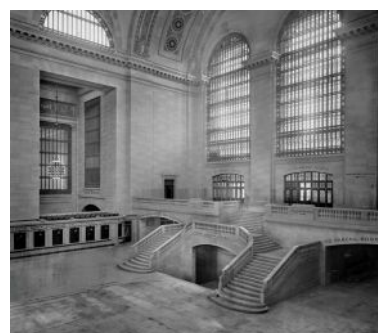


**1912**  
**Casa Milà** | Barcelona | Antoni Gaudí

Of the many masterpieces sprung from the eccentric and utterly individualistic mind of Antoni Gaudí, this is perhaps the most serene. Called La Pedrera (the Quarry) for its undulating sculpted and self-supporting stone facade, the apartment block is an orchestrated symphony of natural forms that cover or color nearly every surface of the interior courts and passages, and erupt in the fanciful landscape of its famous roof. —Carol Willis



**1911**  
**New York Public Library Main Branch**  
New York  
Carrère and Hastings



**1913**  
**Grand Central Terminal**  
New York  
Reed & Stem and  
Warren & Wetmore



**1913**  
**Woolworth Building**  
New York  
Cass Gilbert



**1924**  
**American Radiator Building**  
New York  
Hood & Foulhoux



**1926**  
**Lovell Beach House**  
Newport Beach, California  
Rudolph M. Schindler



**1924**  
**Schröder House**  
Utrecht, Netherlands  
Gerrit Rietveld



**1926**  
**Bauhaus Building**  
Dessau, Germany  
Walter Gropius



**1927**  
**Stockholm Public Library**  
Stockholm  
Gunnar Asplund

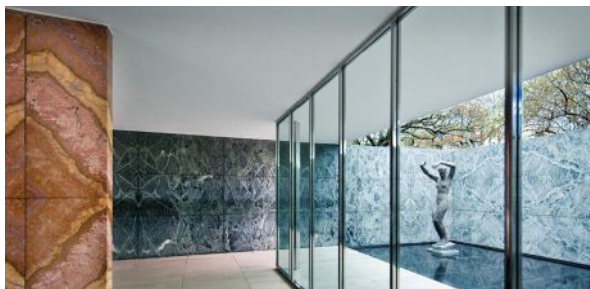


**1928**  
**Ford River Rouge Complex** | Dearborn, Michigan | Albert Kahn Associates

Albert Kahn's first building at River Rouge was an assembly plant for warships, but he went on to help Henry Ford realize his vision of an integrated manufacturing complex for cars. Kahn added such structures as a glass-making plant, a cement plant, a steel mill, and a motor-assembly building. One Kahn innovation was organizing the site into superblocks to ease reconfiguration and expansion. —Joann Gonchar



**1929**  
**Lovell Health House**  
Los Angeles  
Richard Neutra



**1929**  
**Barcelona Pavilion**  
 Barcelona  
 Ludwig Mies van der Rohe



**1931**  
**Empire State Building** | New York | Shreve, Lamb & Harmon

It is the most indispensably iconic symbol of the skyscraper type and of New York for a world audience beyond the professional culture of architecture. It was the world's tallest building for longer than any other structure (1931-74). I have always admired its overall form, silhouette, and profile as a masterly solution by its Beaux Arts-trained architect, Thomas Lamb, as the main designer. He modeled it partly on French medieval churches with dominant towers, such as the 12th-century Cathedral of St. Lazare at Autun, which he admired from his travels as a student. In this way, the Empire State connects to a long tradition of monumental architecture. —Joseph Siry



**1929**  
**Viceroy's House**  
 New Delhi  
 Edwin Lutyens



**1930**  
**Chrysler Building**  
 New York  
 William van Alen



**1930**  
**Kiefhoek Housing**  
 Rotterdam  
 J.J.P. Oud



**1931**  
**Villa Savoye**  
 Poissy, France  
 Le Corbusier



**1931**  
**Aluminaire House**  
 Palm Springs, California  
 Lawrence Kocher and  
 Albert Frey



**1932**  
**Maison de Verre**  
 Paris  
 Pierre Chareau and Bernard Bijvoet



**1932**  
**PSFS Building**  
 Philadelphia  
 Howe & Lescaze



**1933**  
**Paimio Sanatorium**  
 Paimio, Finland  
 Alvar Aalto



**1939**  
**Johnson Wax Building**  
 Racine, Wisconsin  
 Frank Lloyd Wright



**1939**  
**Fallingwater**  
 Bear Run, Pennsylvania  
 Frank Lloyd Wright



**1939**  
**Rockefeller Center**  
 New York  
 The Associated Architects:  
 Reinhard & Hofmeister;  
 Corbett, Harrison &  
 MacMurray; Raymond Hood,  
 Godley & Foulhoux



**1948**  
**Casa Luis Barragán**  
 Mexico City  
 Luis Barragán



**1949**  
**Eames House** | Los Angeles |  
 Charles and Ray Eames

I'm not so sure if it was the architecture, the wonderful displays of the Eameses' folk objects, or a combination of the two that I loved so much when I saw their house years ago. But I also suspect that it might have been Ray Eames herself. She served me and two other guests breakfast with candles and three perfectly arranged strawberries. At the time, I just felt that the house was an extension of her.  
 —Mary McLeod



**1940**  
**Crow Island School**  
 Winnetka, Illinois  
 Perkins, Wheeler & Will and Eliel & Eero Saarinen



**1949**  
**Glass House**  
 New Canaan, Connecticut  
 Philip Johnson



1951

### Farnsworth House | Plano, Illinois | Ludwig Mies van der Rohe

This is one of the great villas of the 20th century—the ultimate “machine in the garden”—where you place a man-made, fabricated, industrial object of great beauty within the garden greenery. It was actually kind of a culmination of things Mies had been doing at IIT, perfecting how to put steel together. He put the house right by a huge tree, very purposely. This idea of marrying nature and the building, you see, he had done before with the Tugendhat House in Brno. The Seagram Building continues this idea, but within a cityscape. —Phyllis Lambert



1952

### Säynätsalo Town Hall

Säynätsalo, Finland  
Alvar Aalto



1955

### Chapelle Notre Dame du Haut

Ronchamp, France  
Le Corbusier



1958

### Seagram Building

New York  
Ludwig Mies van der Rohe, Philip Johnson



1952

### Unité d'Habitation

Marseilles, France  
Le Corbusier



1952

### Lever House

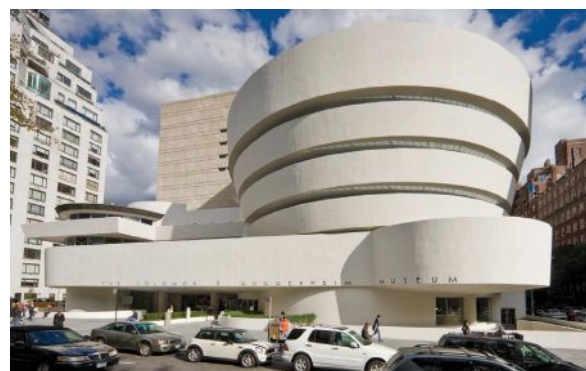
New York  
Skidmore, Owings & Merrill



1952

### United Nations Headquarters

New York  
International Committee of Architects (including Oscar Niemeyer and Le Corbusier), Wallace K. Harrison, chairman



1959

### Solomon R. Guggenheim Museum

New York  
Frank Lloyd Wright



**1960**  
**National Congress Building**  
 Brasília  
 Oscar Niemeyer



**1962**  
**Trans World Airlines (TWA) Terminal**  
 New York  
 Eero Saarinen



**1963**  
**Berlin Philharmonic Concert Hall**  
 Berlin  
 Hans Scharoun



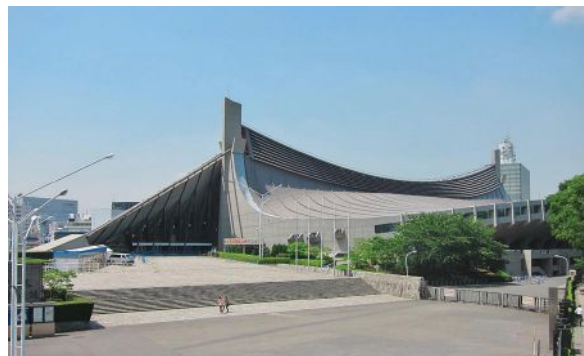
**1963**  
**Yale Art and Architecture Building** | New Haven | Paul Rudolph

Frank Lloyd Wright, an inspiration to Paul Rudolph, broke the box, but he broke it horizontally. It was Rudolph, a master of space and the section, who broke it vertically: the section of the A + A building is a Robie House plan turned vertically, its 36 levels making the building a stepladder through interlocking volumes. Space is vectorial and experiential, and, once Postmodernism was dispatched, the building proved to be an exciting lesson for generations of architecture students.

—Joseph Giovannini



**1964**  
**Vanna Venturi House**  
 Philadelphia  
 Venturi & Short



**1964**  
**Yoyogi National Gymnasium**  
 Tokyo  
 Kenzo Tange





**1964**  
**Marina City**  
 Chicago  
 Bertrand Goldberg



**1966**  
**Whitney Museum of American Art**  
 New York  
 Marcel Breuer and Associates



**1965**  
**Salk Institute for Biological Studies** | La Jolla, California | Louis Kahn

This is Kahn's answer to the urbanistic vision of Renaissance Italy, combined with a magical fountain channeling water across the space to the ocean in a move that recalls gardens of Mughal India and Renaissance villas like Tivoli and the Villa Lante. It is an inspired synthesis and reformulation that never disappoints, no matter how many times you visit. The Salk is arguably the defining work of the greatest American architect. —Marvin Trachtenberg



**1967**  
**Habitat 67**  
 Montreal  
 Moshe Safdie



**1967**  
**National Center for Atmospheric Research**  
 Boulder, Colorado  
 I.M. Pei & Partners



**1967**  
**Ford Foundation Building**  
 New York  
 Kevin Roche John Dinkeloo & Associates



**1967**  
**Montreal Biosphere**  
 Montreal  
 Buckminster Fuller



**1967**  
**Gwathmey Residence and Studio**

Amagansett, New York  
Charles Gwathmey



**1971**  
**San Cataldo Cemetery**

Modena, Italy  
Aldo Rossi



**1972**  
**Kimbell Art Museum | Fort Worth | Louis Kahn**

At the Kimbell, Kahn has achieved a magical synthesis between the calm order of the museum's naves and the heroism of the concrete roof, merging vault and beam in order to convey both natural and artificial light. The diagonal movement between the galleries takes you from one painting to the next in the smoothest manner possible, the rigid order of architecture being totally dissolved on the way.

—Jean-Louis Cohen



**1972**  
**Munich Olympic Stadium**

Munich  
Frei Otto and Günter Behnisch



**1973**  
**Sydney Opera House**

Sydney  
Jørn Utzon



**1972**  
**Centraal Beheer**

Apeldoorn, Netherlands  
Herman Hertzberger



**1973**  
**Museo di Castelvecchio**

Verona, Italy  
Carlo Scarpa

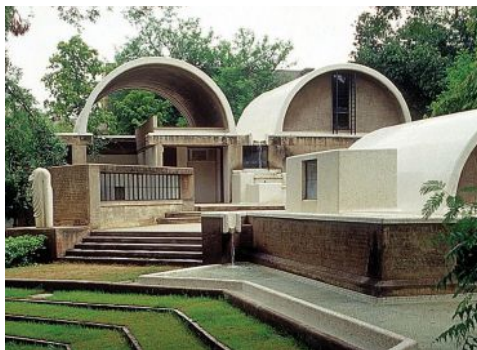


**1977**  
**Centre Georges Pompidou**

Paris  
Renzo Piano and Richard Rogers



**1978**  
**Gehry Residence**  
 Santa Monica, California  
 Frank Gehry



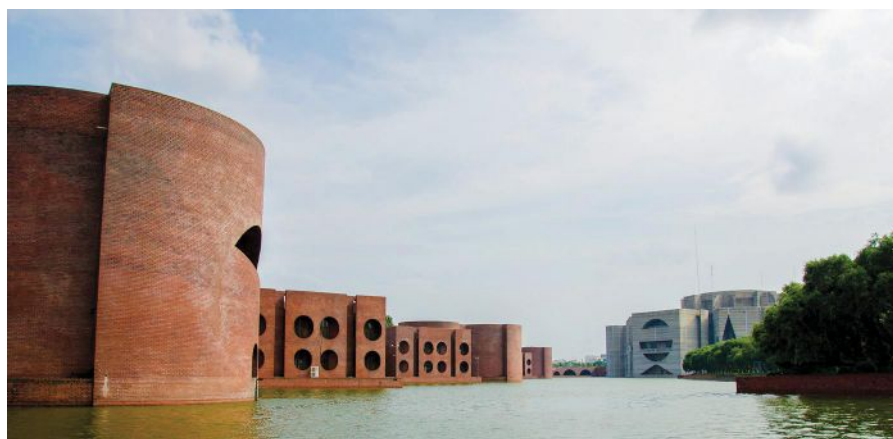
**1981**  
**Sangath**  
 Ahmedabad, India  
 Balkrishna Doshi



**1982**  
**Vietnam Veterans Memorial**  
 Washington, D.C.  
 Maya Lin Studio



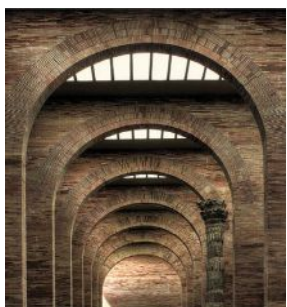
**1980**  
**Thorncrowne Chapel**  
 Eureka Springs, Arkansas  
 E. Fay Jones



**1982**  
**National Assembly Building of Bangladesh**  
 Dhaka, Bangladesh  
 Louis Kahn



**1984**  
**Neue Staatsgalerie**  
 Stuttgart, Germany  
 James Stirling, Michael Wilford  
 & Associates



**1986**  
**National Museum of Roman Art**  
 Mérida, Spain  
 Rafael Moneo



**1982**  
**SESC Pompéia**  
 São Paulo  
 Lina Bo Bardi

The brilliance is in taking over the old factory to develop a social services and recreation facility for members of the union. Instead of tearing down a classic steel structure, she chose to modify and expand it with two towers. Along with the factory sheds, the complex is turned into an extraordinarily active social village. This is Bo Bardi's greatest work.

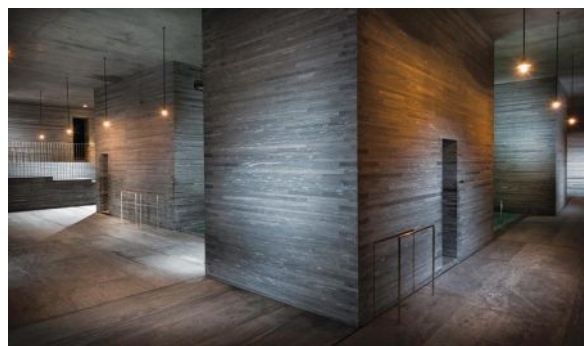
—Anthony Vidler



**1986**  
**Menil Collection**  
 Houston  
 Piano & Fitzgerald Architects



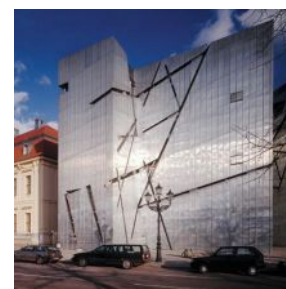
**1989**  
**Church of the Light**  
 Osaka, Japan  
 Tadao Ando Architect and Associates



**1996**  
**Thérme Vals**  
 Vals, Switzerland  
 Peter Zumthor



**1997**  
**Kaze-no-Oka Crematorium**  
 Nakatsu, Japan  
 Maki and Associates



**1999**  
**Jewish Museum**  
 Berlin  
 Studio Libeskind

**1997**  
**Guggenheim Museum Bilbao | Bilbao | Gehry Partners**

One of the earliest monumental expressions of computer-aided design, the Guggenheim Bilbao breaks nearly every rule in the book. It's compositionally messy. It is extravagantly wasteful of space and materials. But it works, because the composition of the volumes, the management of spatial, processional, and visual axes are wonderfully inflected to the site. —Sarah Williams Goldhagen



**1997**  
**Zubizuri Bridge**  
 Bilbao  
 Santiago Calatrava



**1999**  
**Petronas Towers**  
 Kuala Lumpur  
 Pelli Clarke Pelli Architects



**1999**  
**Gallery of Horyuji Treasures** | Tokyo | Yoshio Taniguchi

This building epitomizes the grace and elegance of contemporary Japanese architecture. You approach the building through a contemplative pond, and then it reveals itself layer by layer. It holds treasures from one of the most important Buddhist temples of Japan, but it's as much about the process of getting there as being in the presence of these holy objects. There's a sense that you're making a transition from a mundane, secular world to one worthy of these venerated artifacts. The exquisite materials and attention to detailing are Taniguchi's signature. —Naomi Pollock



**2000**  
**Diamond Ranch High School**  
 Pomona, California  
 Morphosis



**2000**  
**KKL Luzern**  
 Lucerne, Switzerland  
 Ateliers Jean Nouvel



**2001 and 2016**  
**Tate Modern I and II**  
 London  
 Herzog & de Meuron



**2001**  
**Sendai Mediatheque**  
 Sendai, Japan  
 Toyo Ito & Associates



**2003**  
**Jubilee Church**  
 Rome  
 Richard Meier & Partners



**2003**  
**30 St Mary Axe**  
 London  
 Foster + Partners



**2004**  
**21st Century Museum of Contemporary Art** | Kanazawa, Japan | SANAA

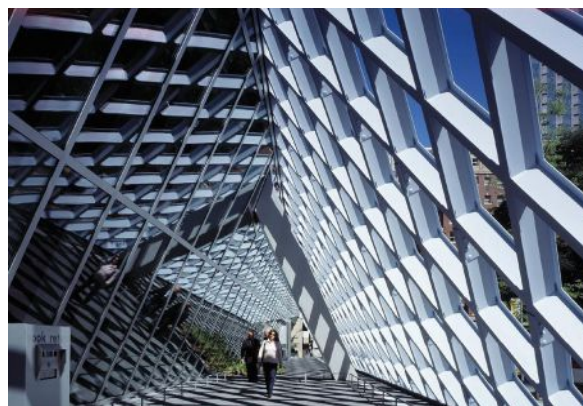
This is the most innovative museum design I know. It is completely original in its approach to museum spaces, which accommodate all kinds of contemporary art, with galleries of different shapes and heights, including one that is a perfect cube. All but two have skylights, which can be adjusted according to the level of illumination needed, and windows in several galleries look onto corridors, where light streams in from the exterior, so the building has a feeling of transparency. —Victoria Newhouse



**2004**  
**Memorial to the Murdered Jews of Europe**  
 Berlin  
 Eisenman Architects



**2004**  
**Millau Viaduct**  
 Millau, France  
 Foster + Partners



**2004**  
**Seattle Central Library**  
 Seattle  
 OMA



**2004**  
**Chichu Art Museum**  
 Naoshima, Japan  
 Tadao Ando Architect and Associates



**2005**  
**Madrid Barajas International Airport, Terminal 4**  
 Madrid  
 Rogers Stirk Harbour + Partners



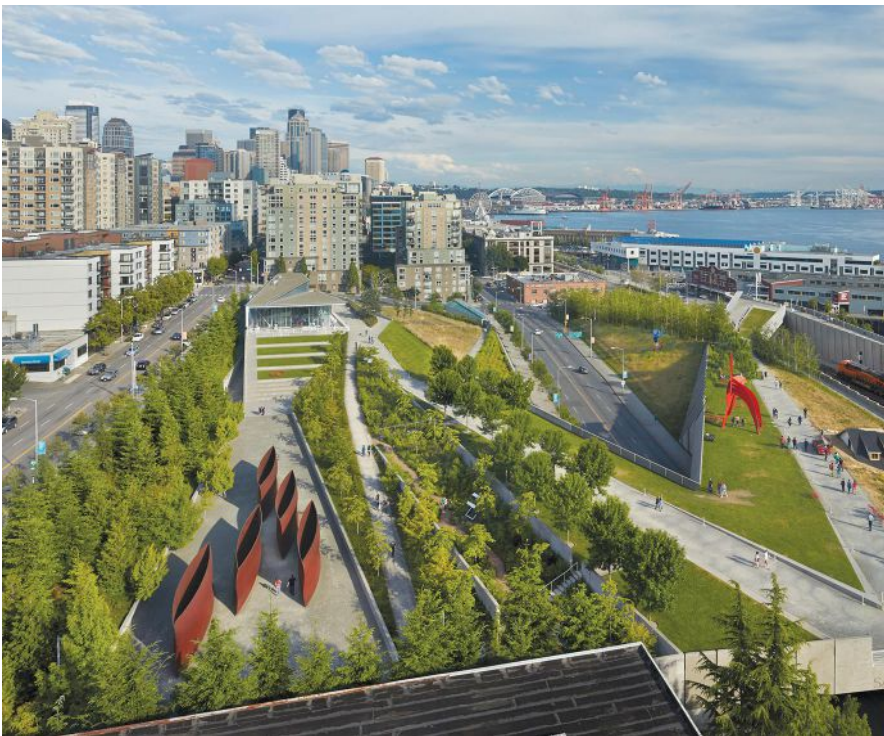
**2006**  
**Apple Store, 5th Avenue**  
 New York  
 Bohlin Cywinski Jackson



**2005**

**Casa da Musica** | Porto, Portugal | OMA

It's such an extraordinary building—so extraordinary in its structure. It's like that great polyhedron in Albrecht Durer's engraving *Melencolia I* of 1514. No one has ever done that architecturally. The way that the structure works is amazing, the way you come into it and come up the steps, the whole trajectory of coming into this great polyhedron. Koolhaas relates very much to the culture of Portugal in the way he uses details such as the Portuguese tiles and the very strong colors in some of the practice rooms and the beautiful curtains by Petra Blaisse. —Phyllis Lambert



**2007**

**Olympic Sculpture Park**

Seattle  
Weiss/Manfredi



**2007**

**BMW Welt**

Munich  
Coop Himmelb(l)au



**2007**

**Oslo Opera House**

Oslo  
Snøhetta



**2008**

**Limoges Concert Hall**

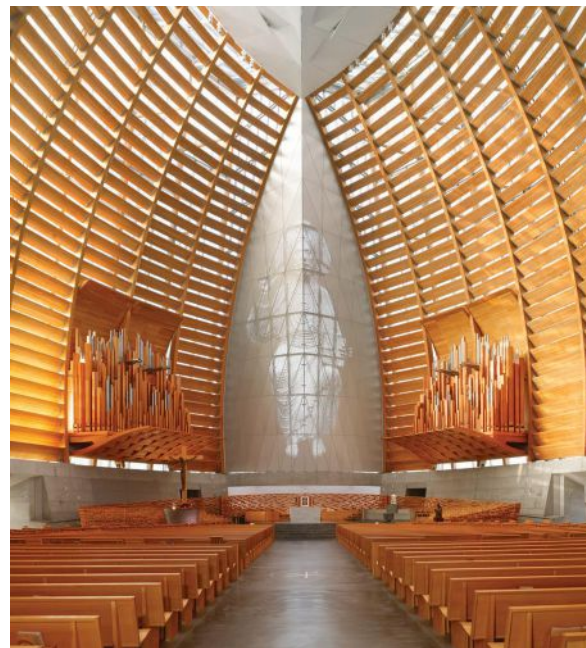
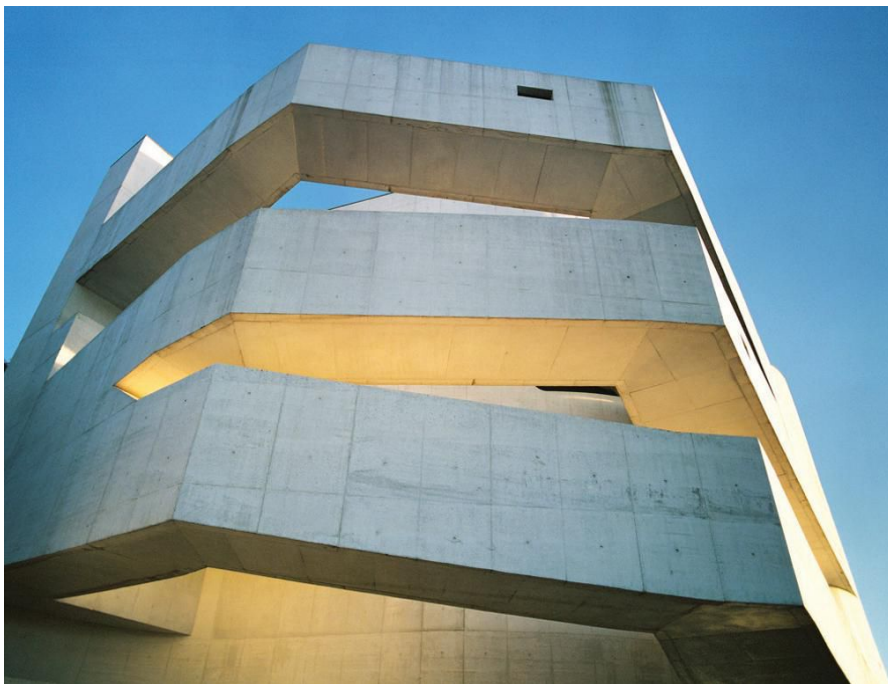
Limoges, France  
Bernard Tschumi Architects



**2008**

**Ningbo Historic Museum**

Ningbo, China  
Amateur Architecture Studio



**2008**  
**Cathedral of Christ the Light**  
 Oakland  
 Skidmore, Owings & Merrill

**2008**  
**Iberê Camargo Foundation** | Porto Alegre, Brazil | Alvaro Siza

This may be Siza's absolute masterpiece. The tension between continuous movement—the dream of so much modernist museum design, as in the Guggenheim—and the need for orthogonal rooms is resolved in one of the richest museum experiences anywhere: interconnected yet restful. The ramping corridors that link one floor to the next are expressed on the facade as distinct elements and are works of intense visual experience. The entrance sequence for the museum is ingeniously engineered into an impossible site, between the riverside highway and a cliff. —*Barry Bergdoll*



**2009**  
**Neues Museum Renovation**  
 Berlin  
 David Chipperfield Architects



**2008**  
**Beijing Capital International Airport, Terminal 3**  
 Beijing  
 Foster + Partners



**2010**  
**MAXXI National Museum of XXI Century Arts**  
 Rome  
 Zaha Hadid Architects



**2009**  
**Herring Center of the Arts**  
 Herring, Denmark  
 Steven Holl Architects





**2009**  
**Aqua Tower**  
 Chicago  
 Studio Gang



**2010**  
**North Carolina Museum of Art**  
 Raleigh  
 Thomas Phifer and Partners



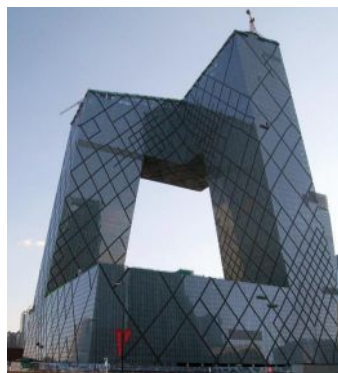
**2011**  
**Poetry Foundation**  
 Chicago  
 John Ronan Architects



**2011**  
**International Commerce Centre**  
 Hong Kong  
 Kohn Pedersen Fox Associates



**2012**  
**Barnes Foundation**  
 Philadelphia  
 Tod Williams Billie Tsien Architects

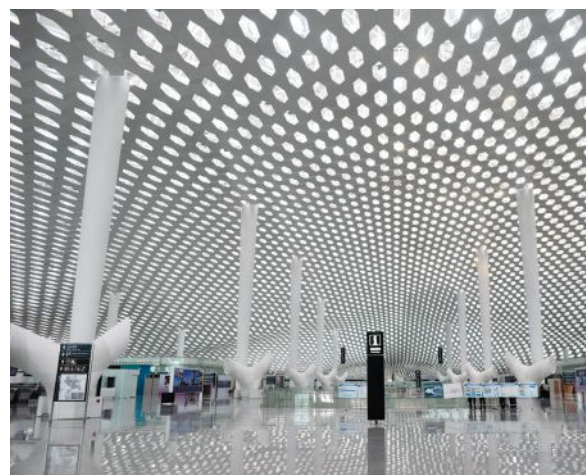


**2012**  
**CCTV Headquarters**  
 Beijing  
 OMA



**2010**  
**Burj Khalifa** | Dubai | Skidmore, Owings & Merrill

More than six years after its opening, SOM's Burj Khalifa remains the world's tallest completed skyscraper. The 2,717-foot-high, 163-story building has a tri-lobed plan that makes the tower appear like a stalagmite that grows naturally out of the earth. But the shape is also the product of the integration of architecture and structure: the three wings buttress the central concrete core. This gives way to an internal steel structure at the 156th floor that carries the mostly unoccupied spire to its tip. —*Joann Gonchar*



**2013**  
**Shenzhen Bao'an International Airport, Terminal 3**  
 Shenzhen, China  
 Studio Fuksas

**2013**  
**Heydar Aliyev Centre** | Baku, Azerbaijan | Zaha Hadid Architects

Here Hadid had a project with enough scope to prove her long-evolving theses about architecture as a topographical field and about the interaction of the building with the ground around it. The building grows from a field highly articulated with ramps, gardens, and pools. By verticalizing its curving plan, the building becomes a mountainous topography of fluid form and space. The design also realizes the promise of the computer as an agent of architectural liquefaction, bending even the technology of the standard space frame into enveloping curves. —Joseph Giovannini



**2013**  
**Novartis Building 337**  
 East Hanover, New Jersey  
 Rafael Viñoly Architects



**2014**  
**GL Events Headquarters**  
 Lyon, France  
 Studio Odile Decq



**2014**  
**The High Line**  
 New York  
 James Corner Field  
 Operations,  
 Diller Scofidio + Renfro



**2015**  
**Matmut Atlantique Stadium**  
 Bordeaux, France  
 Herzog & de Meuron



**2015**  
**Shanghai Tower**  
 Shanghai  
 Gensler

**Acknowledgements**

RECORD would like to thank the following experts for their nominations:  
 George Baird, Barry Bergdoll, Robert Campbell, Jean-Louis Cohen, Kenneth Frampton, Joseph Giovannini, Sarah Williams Goldhagen, Blair Kamin, Phyllis Lambert, Mark Lamster, Mary McLeod, Robin Middleton, Victoria Newhouse, Naomi Pollock, Joseph Siry, Marvin Trachtenberg, Anthony Vidler, and Carol Willis.

# 25 Cult Classics

Lesser-known architectural landmarks acclaimed by various scholars and critics.

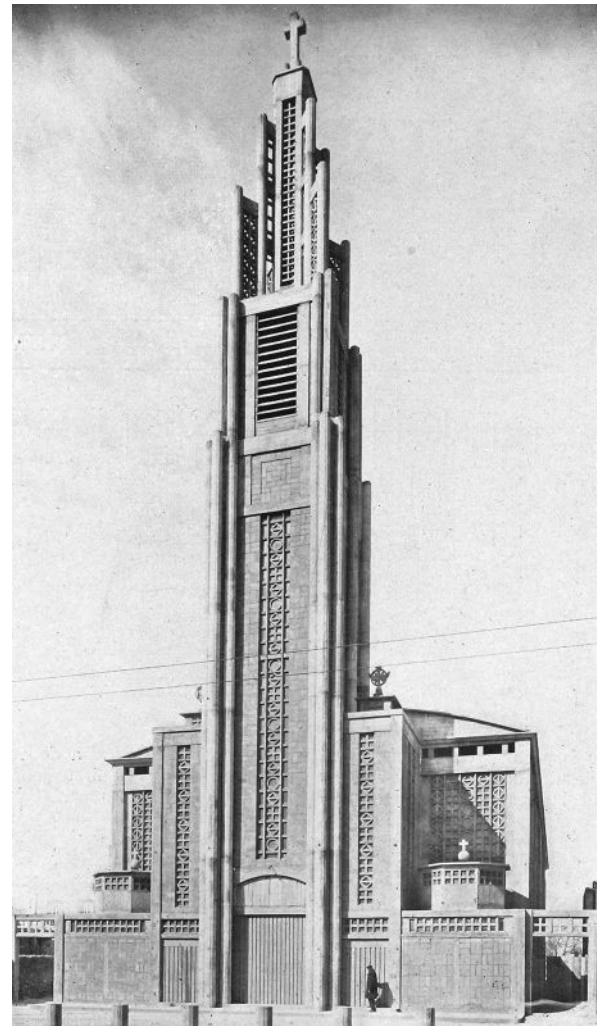
A cluster of buildings cited by critics and historians for the “Top 125 Buildings” since 1891 didn’t make it onto our final list. But these distinctive works of architecture are singular in their use of a formal language or their inventive exploration of materials—and some are just over the top. Most of them are outside the United States and, because they are harder to visit, may have received less attention. Yet they have left an indelible mark on the minds of those who know them, whether by personally visiting the sites or by savoring their presentations in history books, architectural journals, or online. Not all those qualifying for this category have been included: we stopped at 25. But if you have more suggestions, keep them: our 150th anniversary is coming up.



**1911**  
**Palais Stoclet**  
Brussels  
Josef Hoffmann



**1921**  
**Einstein Tower**  
Potsdam, Germany  
Erich Mendelsohn



**1923**  
**Notre-Dame du Raincy** | Le Raincy, France |  
Auguste Perret and Gustave Perret

Akin to the Sainte-Chapelle in Paris, a defining work of the French Gothic movement is updated in the abstract language of reinforced concrete, with its walls filled by brilliant, modern stained glass.  
—Marvin Trachtenberg



**1922**  
**Schindler House**  
West Hollywood,  
California  
Rudolph M. Schindler



**1927**  
**Rusakov Workers' Club**  
Moscow  
Konstantin Melnikov



**1928**  
**Kingswood School Cranbrook**  
 Bloomfield Hills, Michigan  
 Eliel Saarinen



**1930**  
**Open-Air School** | Amsterdam | Johannes Duiker

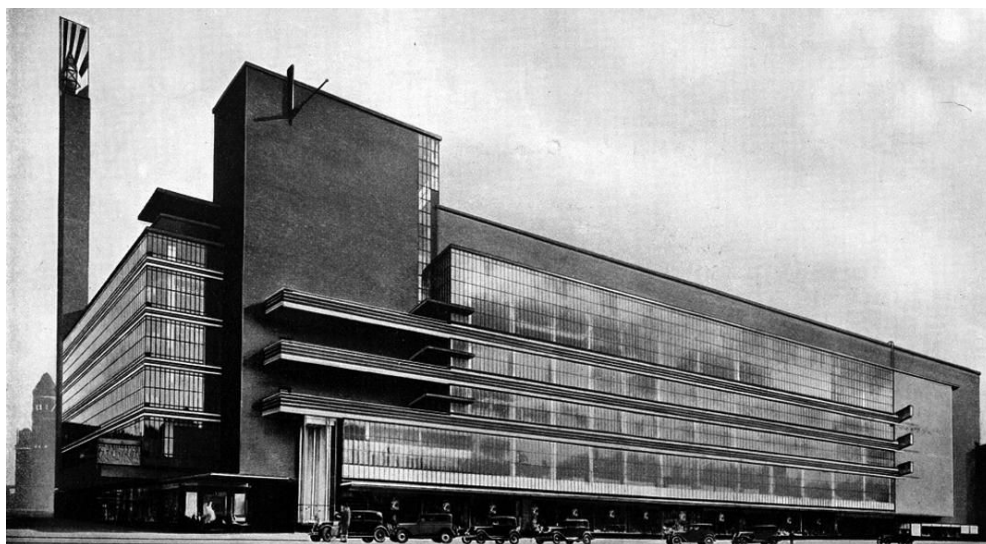
Here you find ultimate transparency in one of the most extensively glazed Modernist buildings of the period. The architecture also creates an intense communal experience for the children at the school. It is a subtle and yet startling insertion in an Amsterdam neighborhood. — *Barry Bergdoll*



**1929**  
**E1027**  
 Roquebrune-Cap-Martin, France  
 Eileen Gray



**1931**  
**Van Nelle Factory**  
 Rotterdam  
 Brinkman &  
 Van der Vlugt



**1930**  
**De Bijenkorf Store** | Rotterdam |  
 Willem Marinus Dudok

Dudok reinterprets a department store as a civic monument, with its trademark campanile and rooftop café terrace crowning the Russian-influenced neo-Constructivist composition, faced in precision brickwork. Ultimately more compelling than Dudok's more familiar Hilversum Town Hall (1931), it was also similarly influenced by Frank Lloyd Wright: the top-lit atrium running through the entire height of the store is evidently derived from Wright's Larkin Building of 1904. — *Kenneth Frampton*



**1932**

### The Triple Bridge

Ljubljana, Slovenia  
Jože Plečnik



**1938**

### Kröller-Müller Museum | Otterlo, Netherlands | Henry van de Velde

In the astounding landscape of birch trees outside Otterlo, the Kröller-Müller Museum's series of pavilions appears as a work of sculpture at the same time that it provides serene connections between the art on display and its surroundings. The poetry of arriving on white bicycles—provided to visitors to make their way along paths through the park—is unforgettable. — *Barry Bergdoll*



**1936**

### Casa del Fascio

Como, Italy  
Giuseppe Terragni



**1943**

### Church of Saint Francis of Assisi | Pampulha, Brazil | Oscar Niemeyer

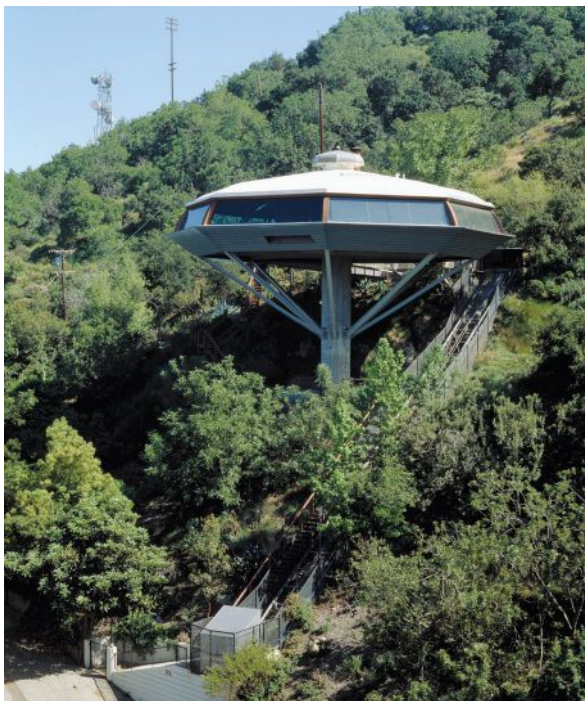
On the shores of Lake Pampulha, Niemeyer built his most poetic structure, thanks to his intimate relationship with the engineer Joaquim Cardoso—who helped him design the thin concrete shells. Also important was the contribution of the painter Cândido Portinari, whose azulejos-tile compositions give the interior the magic of Brazilian Baroque churches. In its refined simplicity, the chapel is probably the best embodiment of the 20th-century ideal of synthesis of the arts.  
— *Jean-Louis Cohen*



**1950**

### Il Girasole

Rome  
Luigi Moretti



**1960**  
**The Chemosphere**

Los Angeles  
John Lautner



**1964**  
**Frey House II**

Palm Springs, California  
Albert Frey



**1965**  
**Shrine of the Book**

Jerusalem  
Armand Phillip Bartos and Frederick John Kiesler



**1966**  
**St. Catherine's College** | Oxford, England | Arne Jacobsen

I consider this to be Jacobsen's masterpiece. Here he keeps the traditional Oxford quadrangle, and yet there's a sense of something new happening—a kind of synco-pated layering from the buildings to the lawn and where hedges act as walls, creating outdoor rooms. The architecture is beautifully scaled and each detail meticulously worked out. The dining room is noteworthy because it is grand, with a certain sense of ritual, but remains completely unpretentious. And of course each element was designed by Jacobsen—including the chairs, cutlery, and lamps. —*Mary McLeod*



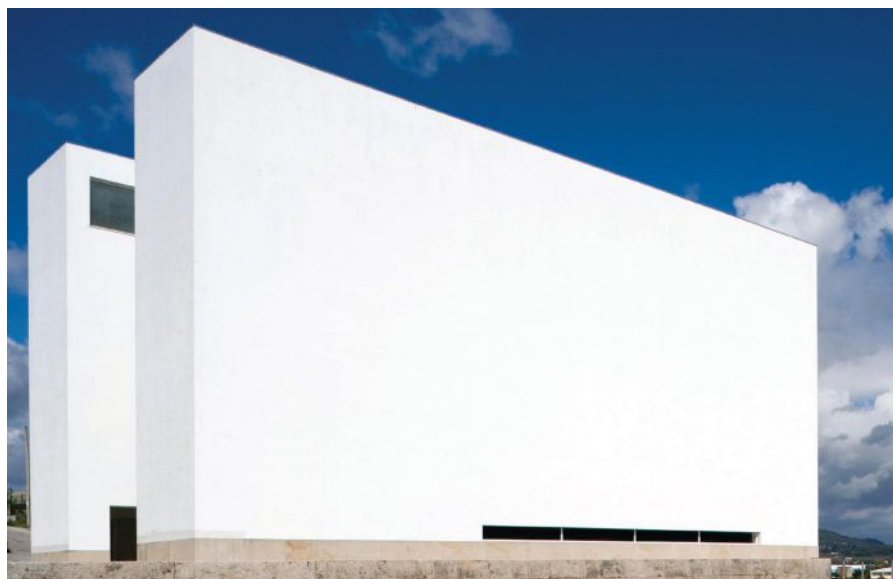
**1966**  
**Church of St. Peter** | Klippan, Sweden | Sigurd Lewerentz

The building lies hugger-mugger on the ground, black brick and black mortar. When you get inside, it is all the same aside from the baptismal font, which is a large, pearly mussel shell. And when you get there, the floor starts to slide down, creating the effect of the ceiling rising, with the heavens opening above you. I don't aspire to be religious, but it is the most sacred space I know in 20th-century architecture—the only one, I might say. —*Robin Middleton*



**1972**  
**Gallaratese Housing**

Milan  
Aldo Rossi



**1996**  
**Santa Maria Church** | Marco de Canaveses, Portugal | Alvaro Siza

The church is just two great square towers with a simple rectangular building behind. Inside, the ceiling curves into the north wall, and on the other side it is a horizontal slit, so you see the city at a distance. It's sculptural, but such a simple sculptural form—not baroque at all. It's an oasis: as you enter, you are taken away from the city. The thing that I find so extraordinary in Siza's work is that he's so conscious of the vernacular but uses it in abstract ways. —Phyllis Lambert



**1976**  
**Bagsværd Church**  
Copenhagen  
Jørn Utzon

**2002**  
**Yokohama International  
Passenger Terminal**  
Yokohama, Japan  
Foreign Office Architects



**1998**  
**Jean-Marie Tjibaou  
Cultural Center**  
Nouméa, New Caledonia  
Renzo Piano Building Workshop

# My Favorite Building

Record asked a dozen leading architects to tell us which single building had the biggest impact on their thinking and design. Some of their answers may surprise you.

## NORMAN FOSTER

**THE PERIOD** that I find most inspiring is the 19th century. We see its can-do mentality in the work of many people of the time, whether they were tunneling under rivers or throwing bridges across ravines and gorges. And we see it in the example of Joseph Bazalgette, who built the London sewer network. He used the project as an opportunity to create underground public transportation, and managed to transform infrastructure into a work of great civic beauty with the construction of the Thames embankments.

If I were to sum up that spirit with one building, it's Joseph Paxton's **Crystal Palace** for the Great Exhibition of 1851—which was not created by an architect, but a gardener. It was an extraordinary act of competence that required the ability to create a new industry for a building, which had to be designed and constructed almost overnight, at an epic scale, and with what I suspect would have been breathtaking beauty. It is the building I would most like to have visited.

Such buildings as the Crystal Palace had a romance that was absolutely contagious and enthralled the public. Although industrialization had some appalling social consequences, these works show an incredible optimism. Today, those of us who are privileged to engage in projects on that scale in other parts of the world still find that belief in the future, a belief that has not become jaded and cynical. What I'm invoking in the heroic works of the 19th century is really that attitude of mind.



Crystal Palace | 1851 | Joseph Paxton | London



## Centre Georges Pompidou

1977  
Studio Piano &  
Rogers  
Paris

## THOM MAYNE

**I WENT** to USC in the late '60s—when the school was anti-history. I came away with very little knowledge of even the major characters—Mies, Corbusier. So I was largely self-taught. After I began my practice, I went through a Kahn phase, a Rudolph phase. Remember, I was still a kid. I became fascinated by James Stirling, and I went to England and saw all his work. My list of influences was enormous. That being said, if I had to name a single building, it would be the **Centre Pompidou**. It had this incredible influence on me, in terms of the intensity of the research that went into it. I had two friends from UCLA who were working on the building, and I visited them at the office. There were dozens of blue-foam models of the gerberettes [custom cast-steel elements]. I was completely bowled over by the seriousness of the investigation. I didn't go home and start making buildings that look like the Pompidou. That's not my architecture. I was interested in its aspirations, in its ambition—the notion of challenging the Louvre, the museum as supermarket. It was a completely new model, architecture shaping how we understand culture. I had an exhibition there in 2006. Designing the show, we put everything on a glass floor. We didn't touch the walls. We were reverential.





**Fallingwater** | 1939 | Frank Lloyd Wright | Bear Run, Pennsylvania

## RICHARD MEIER

**I HAD** the pleasure of spending the night at **Fallingwater**, as a guest of Edgar Kaufmann Jr. It must have been the early '60s. But I have the experience in my head as though it was yesterday. It starts when you drive up—seeing it, not seeing it, then seeing it again. The whole approach is brilliant. There's not a thing that's accidental, that's not a part of the plan. It's total. Later, when you walk the site and see how the house is perched on this rock over the waterfall, it's truly magnificent. I had a bedroom that was maybe 7 feet by 10 feet. It was intimate—but so is the whole house. From photos, you think it's a big building. It's not. The living-dining room makes people come together. But, of course, that room explodes onto the terrace over the waterfall—part of an unbelievable series of spatial experiences. It's like the Guggenheim Museum: it's amazing from the outside, but the interior space is even more amazing. I haven't been there since, but it's still with me. If I could achieve something like that, I'd be very happy.

## DENISE SCOTT BROWN + ROBERT VENTURI

**IF YOU** ask Bob, "What is your favorite building?" he will say the Hagia Sophia. If you ask him, "What is your favorite Modern building?" he will say the **Villa Savoye**.

For me? I remember, at the age of 2, standing with my parents on an empty lot looking at blueprints. We had moved from Zambia to South Africa and were building a house. It was by Norman Hanson, who had made contact with Le Corbusier and then returned to do fantastic International Style houses in Johannesburg. We built that house and I lived there until I was 12. For that reason, the memories other kids have about attics and creaky staircases I have about flat roofs and lally columns. I remember a porthole window, watching the light come through it, and the circle of sun moving across the room as I lay on my parents' bed in the late afternoon. I harbored a love of early Modernism then, and I am still an early Modernist—and, by the way, so is Bob. Bob is the most dour functionalist I've ever come across—even more than me. We really just added one more function—communication through decoration—to the functions of early Modernist buildings.



**Villa Savoye**  
1931  
Le Corbusier  
Poissy, France



**Lakofski House**  
1933  
Norman Hanson  
Johannesburg



**Shosoin Treasure House** | 750s | Nara, Japan

## FRANK GEHRY

**GOING BACK** to my absolute roots in architecture, I would say the **Shosoin Treasure House** in Nara in Japan. When I was starting out in architecture in L.A., the Japanese influence was strong. I first saw the Shosoin repository in person when I got the Pritzker Prize [in 1989], at the Todai-ji Temple next door, but I had known it for a long time. It's from the 750s. The Ise Shrine, Katsura Palace, Kiyomizu-dera temple were all required study, like the great buildings of past western culture that we revere. The Kiyomizu is on a hilltop—it's really a hard climb up. I've been there twice. The substructure that anchors the temple to the hillside is a major architectural accomplishment. The Shosoin is a warehouse—it's much simpler. It's in the log cabin style called *azekura* and shows the elegance and simplicity of Japanese building. Mesmerizing for a beginner.



Mosque-Cathedral of Córdoba | 8th–18th centuries | Córdoba, Spain

## RAFAEL MONEO

**THE CÓRDOBA MOSQUE**, which I first visited as a student, has been a continuous lesson to me for more than half a century. The building is a theological experience. The Islamic sense of an indecipherable god is present there. The essence of architectural space is expressed in that forest of columns, many of which were Roman. That's not about recycling—it's about the unfolding of history. When the mosque was enlarged, the formal rules that created the building allowed it to grow without losing its essence. Of course, in the 16th century, there was a very radical intervention—an entire cathedral was placed inside the mosque! But even that didn't destroy it—the combination of the Islamic and the late Gothic only adds to the sense of history. A building that can accept something so different is a marvel. I think you are looking at one of the most successful buildings in all of architectural history. And there is no one architect associated with it. It's about architecture, not about a single architect. That idea has stayed with me throughout my entire career.



Municipal Orphanage | 1960 | Aldo van Eyck | Amsterdam

## FUMIHIKO MAKI

**FOR ME**, the building that inspired the most fundamental thoughts on architectural issues is the **Municipal Orphanage** in Amsterdam, by Aldo Van Eyck, completed in 1960. The first reason is that the building clearly shows how to construct a dynamic whole out of a thoughtful composition of generic elements—in this case, a spatial unit in and around which children live and play. Van Eyck says this idea was inspired by villages in Africa, but it could be any village, as Bernard Rudofsky illustrated in *Architecture Without Architects*, some years ago [1964]. Van Eyck has beautifully realized this concept using a modern architectural vocabulary. The second reason is that the building clearly shows the importance of guiding sight lines in the organization of space. Humans tend to act after first seeing; thinking and feeling come later. I have not seen such a beautiful analysis of the relationship between sight line and space before or since. These two issues are eternal ones, and the Orphanage is a skillful and didactic example of how modern space is driven by them. It continues to inspire my work to this day.

## JACQUES HERZOG

**TOUGH QUESTION.** I don't want to sound arrogant, but I have never been influenced by a specific building. And I think Pierre would give you pretty much the same answer. We look closely at many buildings, and we see a lot of beauty in many of them. We've never really admired one building specifically. Last year, I wrote a text about my visit to the Farnsworth House. I was ready to admire it for its beauty, but I discovered many things that made no sense. The truth is, it's not as great as everybody thinks. I wrote a very critical text. Still, I learned from the house, because it activated my perception. Active perception is what you create out of what you see. It makes you become conscious and critical. Perception therefore also has a political and erotic side. Your perception is more important than the object being perceived—more important than any specific building.



**Dome of the Florence Cathedral** | 1436 | Filippo Brunelleschi | Florence

## RENZO PIANO

**I'M IN TROUBLE**, because so many buildings have influenced me. When I see a building for the first time, I don't focus on what I don't like; I focus on what I do like. So I absorb things from many buildings. But if I have to pick one, it would be **Brunelleschi's Dome** of Santa Maria del Fiore, in Florence. I spent two years in Florence as a student, in '58 and '59, and I've always loved the story of Brunelleschi. This man started not as an artist but as a craftsman, apprenticed to a goldsmith; soon he was making clocks, which meant working with weights, with balance, and with movement. Then he became an architect, designing buildings using the knowledge he acquired making clocks. I've been convinced that you might start as a craftsman, then become more of an artist, possibly, but it's almost impossible to do the opposite. As for the cupola itself, it was very inventive; the lantern at the top acts as the keystone of the dome. It's a very radical idea. Brunelleschi made a model of the dome, which sat in the piazza. And it stayed there for years—because it took him years to persuade people that it would work. It's a lesson in stubbornness. It taught me about the art of believing in what you are doing and defending your idea. The dome is beautiful, but so is the story behind it.



**Chapelle Notre Dame du Haut** | 1955 | Le Corbusier | Ronchamp, France

## TADAO ANDO

**THERE ARE** many buildings that have remained in my heart and that I still think about from time to time. If I had to choose one from among them, it would have to be Le Corbusier's **Ronchamp Chapel**. The great master who laid the foundations for Modernism created the space by truly unleashing his genius late in his career. Here, he paradoxically demonstrated the limitless possibilities of Modern architecture by creating the unrestrained sculptural form of concrete in an apparent rejection of the trajectory of his earlier work. At the same time, he proved, with the almost violent space of rich light, that architecture can be made through the pursuit of light alone. It is a rare work that has, from the moment of its birth, brimmed with the power to last throughout time, like the spaces of classical architecture. I had the opportunity to witness a Mass when I visited the building for the second time, in my 20s. People were praying intently, shoulder to shoulder, under the beautiful yet intense light. To this day, that scene has been an inspiration for me in my pursuit to create architecture as a place for people to gather.



## **Cabanon de Vacances**

1952  
Le Corbusier  
Roquebrune-  
Cap-Martin

## TOYO ITO

**I VISITED** the **Cabanon de Vacances** several years ago for the first time. I was deeply impressed by the fantastic architectural concepts drawn from such a modest *cabanon*, created by the master of 20th-century architecture in his last years. It is often the case that architects lose their creative energy in their later years. I wish to express my deepest admiration for Corbusier's affluent architectural creation as he aged. I also admire his powerful works in Chandigarh and Ahmedabad in India.

# 25 Lost Treasures

Too many significant works of architecture from the last 125 years have been demolished or changed so radically as to be unrecognizable.

BY ROBERT A.M. STERN

AS AN ARCHITECT committed to the preservation of buildings from the near as well as the distant past, I have come to the conclusion that the architecture profession as a whole is not often as committed as I am. The general public is surprised to find few architects on the barricades, fighting to protect endangered notable buildings from the past. For practicing architects, there appears to be a cycle: the current generation does not value the one before it, but it does tend to look with sympathy on the work of the generation before that: consider Victorian houses—reviled by Beaux-Arts and modernist architects in almost equal measure, but now treasured by Postmodernists.

The Paul Simon song tells us that there are 50 ways to leave your lover. Here is my short list of ways to lose a beloved landmark:

- 1. Political reasons and acts of terrorism.** In today's climate, these can't be ignored, as we learned on 9/11/2001. In 2015 we lost Palmyra, in Syria.
- 2. Greed.** We often assume that more money can be made with something new.

**3. Narcissism.** Too many architects think that their new designs will be better than those from the past.

Sometimes this leads to death by emasculation, as in the case of the Four Seasons Restaurant in the Seagram Building: how much of it will survive Seagram owner Aby Rosen's direction now that its grace notes, including the furniture and the serving pieces, have been auctioned off? On the other hand, some buildings, never meant to last, have been rebuilt with all the best intentions. Take Mies van der Rohe's German National Pavilion for the Barcelona International Exposition of 1929. I have trouble with these reincarnations. The Barcelona Pavilion was only known through photos; not one architect or historian of consequence had ever actually visited it. But it was rebuilt in the 1980s. When I saw it, I found to my dismay that it was not as I "knew" it from black-and-white photos. For example, the colors—bright reds and greens—were a shock, and not a good one. The scale seemed off. I have seen it twice now and wish it had remained lost. I prefer my memories.



## 1. World's Columbian Exposition of 1893, Chicago

Planned by Daniel Burnham; landscaping by Frederick Law Olmsted. Demolished 1894.

The Chicago World's Fair was a dream. If only it could have lasted! But it did have an afterlife, as it were: Burnham's plan inspired the City Beautiful movement that led to glorious public architecture and place-making around the country as well as popular resorts like Luna Park at Coney Island. Thankfully, I have childhood memories of the latter before it was partially consumed by fire and the rest destroyed by post-World War II urban renewal. Significantly, a bit of the Chicago exhibition has endured in Charles Atwood's Palace of Fine Arts, which was saved and eventually rebuilt to serve as the Museum of Science and Industry.

## 2. Larkin Building, Buffalo Frank Lloyd Wright. Built 1906. Demolished 1950.

Although it is familiar from grainy black-and-white photos, the Larkin Building itself seems not to have been much visited by architects or scholars. Consequently, most of us did not learn that it was clad in bright red brick until near the end of its life, when Wright captured it on color movie film. Wright's great monument to labor was not torn down to make way for something else; it was demolished because it had outlived its original purpose, and the city of Buffalo did not see its value as an artifact.



## 3. Imperial Hotel, Tokyo Frank Lloyd Wright. Built 1923. Demolished 1967.

This hotel, which expressly catered to non-Japanese visitors, was a triumph of engineering—it withstood the 1923 earthquake in Tokyo. But it was also a brilliant essay in synthetic form, combining an academic classical plan with highly inventive decorative detail. It was torn down to make way for a bigger "more modern" building, killing the goose that laid the golden egg: the new hotel is hardly one for the history books or a tourist attraction. Fortunately, part of Wright's building has been reconstructed in an outdoor architecture museum at Nagoya.



#### 4. Midway Gardens, Chicago

Frank Lloyd Wright. Built 1914.

Demolished 1929.

One of Wright's undervalued masterpieces, this entertainment venue was designed when German-style beer gardens were very popular in Chicago. Like the Imperial Hotel, Midway Gardens revealed Wright as a master of academic planning and a synthesizer of exotic forms such as those of the Viennese Secession. But World War I and its anti-German feeling, followed by Prohibition, gave it little chance to survive. Certain buildings have short, unhappy lives.



#### 5. Madison Square Garden, New York

McKim, Mead, & White. Built 1890.

Demolished 1925.

This great first building to contain multiple establishments, all devoted to entertainment, was designed by Stanford White, who was fatally shot in its roof garden in 1906. The Garden entered a slow decline until Prohibition, and finally real-estate pressures did it in. The full-block site on Madison Square became too valuable as the largely residential area gave way to large-scale office towers.



#### 6. Madison Square Presbyterian Church, New York

McKim, Mead, & White. Built 1906.

Demolished 1919.

Here is another short-lived building. In spite of its dazzling design, lavishly detailed inside and out, the church only lasted 13 years, at which time it was torn down to make way for an expansion of the Metropolitan Life Insurance Company. Its six pale green granite columns were rescued by architect Donn Barber for his Hartford Times Building (1920).



#### 7. Pennsylvania Station, New York

McKim, Mead, & White. Built 1910. Demolished 1963.

This was a great building, at once classical and modern. The beneficiary of the introduction of electrically powered trains, it was a landmark in the evolution of transportation typology. Brilliantly orchestrated pedestrian circulation paths led from the main entrance and from the side streets, where Venice-like bridges allowed travelers to cross sunken roadways designed to accommodate taxis and automobiles. The grandeur of the ticket hall, modeled on Rome's Baths of Caracalla, was rivaled and complemented by the equally grand iron and glass waiting room, which brought natural light down to the train platforms below. Again, evolving real-estate patterns led to a great building's downfall. Again, the profession sat on its hands—most architects seemed unconcerned or were outright dismissive about what they deemed to be a stylistic warhorse. Notably, along with certain enlightened citizens, architectural young Turks saw the building's value and picketed against its destruction. Alas, they were unable to save it.

#### 8. Low House, Bristol, Rhode Island

McKim, Mead, & White. Built 1887. Demolished 1962.

As plans were being drawn up for the destruction of Penn Station, this great iconic temple of a house, featuring an interesting half-level cross section that was largely unknown until historians tackled the archives in the 1980s, was torn down. Ironically, those responsible—descendants of the original owners—wanted something more “modern.” It is interesting to note that George Nelson and Gordon Chadwick, architects who were antitraditional to the core, saw its value and designed a house for Otto Spaeth in East Hampton, New York, in 1955 that was directly inspired by MM&W's cottage. The Spaeth house still stands.



#### 9. Dodge House, Los Angeles

Irving Gill. Built 1916. Demolished 1970.

This was Gill's largest house. Like so many of his other buildings, it seemed very similar to those of Adolf Loos, through there is no evidence of any connection between the two. The Dodge House sat on King's Road, across from the Schindler house (now

home to the MAK Center for Art and Architecture), so it was part of a very important local scene. Undeterred by protests led by Denise Scott Brown, the city ordered its destruction to make way for a school, but nothing was ever built on the site. What a waste.





**10. Singer Building, New York**  
Ernest Flagg. Built 1908. Demolished 1968.  
Probably the tallest building to have been torn down anywhere, its needle-like tower was not deemed useful in an age of super-scale blockbuster office buildings such as Skidmore, Owing & Merrill's U.S. Steel, which replaced it on Liberty Street. When its likely demolition came to the attention of the just-established New York City Landmarks Preservation Commission, the group took no action—it seems that the preservationists were afraid that the new ordinance would be tested in court and might not survive. So this 612-foot-tall, slender pencil tower on a broad base, anticipating those now going up in Manhattan, came down.

**11. Schiller Theater Building, Chicago**

Adler & Sullivan. Built 1891. Demolished 1961.  
With few exceptions, Sullivan's work was not appreciated in the post-World War II era and only began to be venerated with the publication of John Szarkowski's *The Idea of Louis Sullivan* in 1956. Sadly, the book was not enough to save this masterwork. It seems that most architects in Chicago were more interested in Mies and believed that less Sullivan was more.



**12. Chicago Stock Exchange, Chicago**  
Adler & Sullivan. Built 1894. Demolished 1972.  
Another victim of real-estate development, its death sentence led to the Exchange's being picked apart in pieces, with museums benefiting from its fragments. But a room here, the ironwork of an elevator there—is that preservation?

**13. Masonic Temple, Chicago**

Burnham and Root. Built 1892. Demolished 1939.  
It was once Chicago's tallest building (302 feet high), and featured a nine-story atrium. When construction of a new subway threatened its foundations, the building was torn down and replaced by a two-story "taxpayer."



**14. Richfield Tower, Los Angeles**  
Morgan, Walls & Clements. Built 1929. Demolished 1969.

At the time the tower was in jeopardy, people had no sense of an Art Deco style. In fact the style had not even been named until English art historian Bevis Hillier started to write about it in the 1960s. Without proper classification, it seems its preservation had no "hook" on which to hang calls for support.



**16. Riverview High School, Sarasota, Florida**  
Paul Rudolph. Built 1958. Demolished 2009.

A few houses by Rudolph, the towering talent of the first American generation of Modernists, have been lost, and his Orange County Government Center in Goshen, New York (1971), is threatened, although his Art and Architecture building at Yale University (1963) was restored in 2008. Riverside, one of his two high school buildings in Sarasota, met the wrecking ball despite a protest and imaginative proposals for its reuse. Here a number of architects were engaged in an effort to save the building, but bureaucratic intransigence carried the day.



**15. American Federation of Labor Medical Services Building, Philadelphia**

Louis Kahn. Built 1956. Demolished 1973.  
A superb urban building. Kahn followed up on his design for the hermetic Yale Art Gallery in New Haven (1953) with these elegant, windowed facades. But the building didn't survive the construction of the Vine Street expressway.



**17. Orinda House, Orinda, California**

Charles Moore. Built 1962. Drastically remodeled 2006.  
One of the great works of the Postmodern era has been swallowed up by a remodeling that reduces it to the status of a pickle slice in a ranchburger. The house lifted California domestic architecture from the compositional laxity of Bay Area coziness to the level of classical discipline derived from a careful study of Louis Kahn's architecture.

### 18. Two Columbus Circle, New York

Edward Durell Stone. Built 1964. Renovated 2005.

Originally known as the Huntington Hartford Gallery of Modern Art, the palazzo-style marble-clad structure was criticized when it was built for not being modern (or orthodox modern)—especially by Ada Louise Huxtable in *The New York Times*. By the time the Museum of Art and Design wanted to take it over in 2000, most architects and critics seemed unwilling to recognize that tastes had changed. What Huxtable and others thought was a travesty of modernism in early 1960s was now seen as a transgressive harbinger of stylistic change—at least by some—but not by the museum and its architect, Allied Works, who, preferring the coziness of orthodoxy, reduced an icon to a bland box.



### 19. New Haven Coliseum, New Haven, Connecticut

Kevin Roche John Dinkeloo and Associates. Built 1972.

Demolished 2007.

A great loss. This was the perfect emblem of the heroic scale of architecture in the 1950s and 1960s—of postwar America's optimism. Lording it over an interstate highway, it was designed to also be a good citizen of the surrounding streets, but the plans for a market at the ground level were never realized. When the size of the hockey rink was deemed functionally inadequate, the building came down.



### 20. Addition to the Observatory Dining Hall at the University of Virginia, Charlottesville, Virginia

Robert A.M. Stern Architects. Built 1984. Demolished 2005.

Today, the architecture created by my Postmodern generation is highly vulnerable to death by distaste. My own building at the University of Virginia, a dining hall, was torn down because the university needed a bigger facility to accommodate freshman dining. The new structure is as bland as the original one we had been asked to camouflage with our own building. Needless to say the university didn't come back to me.



### 22. Bronx Developmental Center, New York

Richard Meier & Partners. Built 1977. Partly demolished and significantly altered 2002.

This major building by Meier, prominently sited on the Hutchinson River Parkway, was distinguished by its shiny gray aluminum-clad exterior. That and its efficient plan for housing mentally and physically challenged children made it absolutely the building of the year when it opened. But, as patterns of health care evolved, the state agency sold the building to a developer, who reskinned it and turned it into an office building. It is the major loss for my generation.

### 21. House III, Lakeville, Connecticut

Eisenman Architects. Built 1971. Demolished circa 2000.

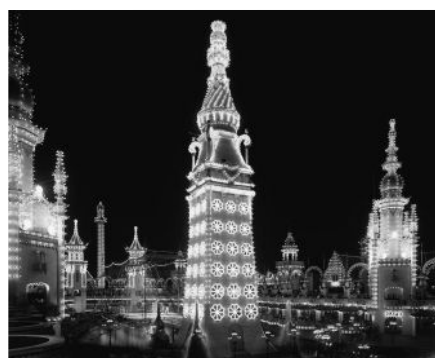
Asked what happened to House III, Peter Eisenman said, "It's gone." The powerfully composed construct was as much a built compositional theory as an idea of inhabitation. Peter's houses were not always designed for domestic bliss.



### 23. American Folk Art Museum, New York

Tod Williams Billie Tsien Architects. Built 2001. Demolished 2014.

This is such a sad, ironic story: one architect, Diller Scofidio Renfro (DSR), and its client, the Museum of Modern Art (MOMA), claimed it could not accommodate the building or even its facade as part of an expansion. Maybe the Folk Art wasn't that good as a museum, but the architects and MOMA should have kept the bronze (tombasil) facade—especially since the uniformity of the glass box for the rest of the museum is unrelenting. DSR could have done better.



### 24. Luna Park, Coney Island, Brooklyn

Frederick Thompson and Elmer "Skip" Dundy. Built 1903. Demolished 1946. This was one of the best amusement parks ever, a fantastic use of brilliantly illuminated historical architecture. A stepchild of the World's Columbian Exposition, it made clear that monumental architecture did not preclude popular appreciation or the possibilities for good-time placemaking.



### 25. Stardust Resort and Casino, Las Vegas

Built 1958. Renovated and expanded 1964, 1977, 1991. Demolished 2006. One of the earliest motels on the Strip, it was certainly the quintessential one, glorified by its great illuminated sign. Stardust represented the Las Vegas of the era just before Robert Venturi, Denise Scott Brown, Steven Izenour, and a bunch of Yale students analyzed the Strip as if it were ancient Rome. Since then, several more layers of Las Vegas have been created and replaced. Someday the Strip will become an archeological dig like Schliemann's Troy.

# Pungent and Pithy

A brief history of architectural criticism in Record.

BY SUZANNE STEPHENS

**FIFTY YEARS AGO**, in the 75th-anniversary issue of RECORD, editor in chief Emerson Goble addressed an issue he was constantly asked about—why the magazine wasn't as critical as it had been in its early years. "We are charged with not having the nerve," he wrote in July 1966. Before giving his reasons, let's look at the magazine's beginnings, when its critics would "give 'em hell," as Goble put it.

When RECORD was founded in 1891, it aimed for a general audience as well as a professional one. Its critics Montgomery Schuyler, a newspaper journalist, and Russell Sturgis, an architect and historian, straightforwardly assessed the pluses and minuses of a building or urban enclave, according to aesthetic and, to a degree, functional criteria. Schuyler castigated heavy-handed eclecticism—what he called "artchitecture"—with its mishmash of styles. He considered proportion and scale, as well as how the program and structure were expressed on a building's exterior. Sturgis's more traditional aesthetic emphasized a Ruskinian predilection for the play of light and shadow—"the doctrine of the beauty of the penumbra," as he called it. Yet Sturgis also welcomed the functional expression of structure in new buildings going up in the 1890s. He approved the steel-framed "rationalism" of the Bayard Building in New York by Louis Sullivan (with Lyndon Smith) but regarded the brick arches under the cornice as an "anomaly" (July–September 1898).

Both Schuyler and Sturgis tended to critique a building by scrutinizing the facade as if it were a two-dimensional composition they were viewing while standing on the sidewalk in front. When Schuyler also wrote about the Bayard Building, he barely discussed the interiors, nor did he mention the plainer sides of the 13-story high-rise (January–March 1899). He commended the terra-cotta on the main facade, which revealed the skeleton, and pointed to the way the different parts of the program—



**FORM FOLLOWS FUNCTION** When Louis Sullivan designed the Bayard Building (1899), both Montgomery Schuyler and Russell Sturgis commended the expression of the steel-frame structure with terra-cotta cladding in the pages of Record. Schuyler also pointed to the architect's clear reading of the building's functional uses in Sullivan's articulation of the base (lobby), shaft (offices), and mechanical services (top).



lobby in the base, offices in the shaft, mechanical services under the cornice—were signified in the design.

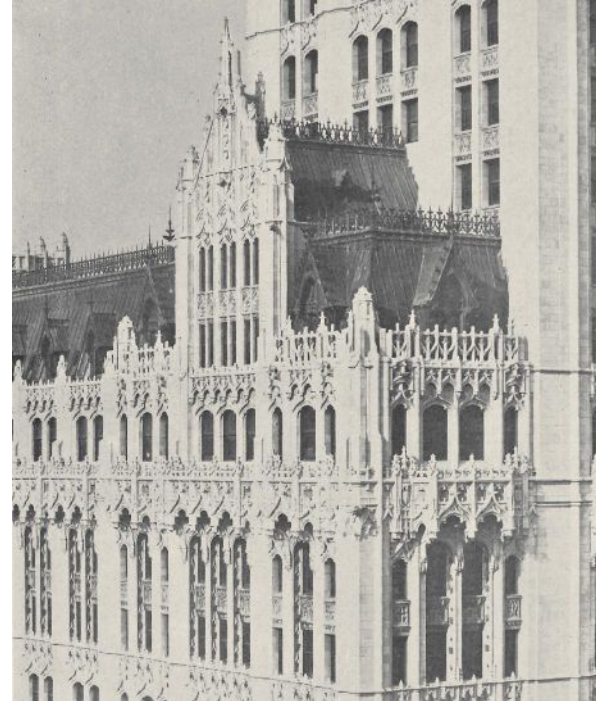
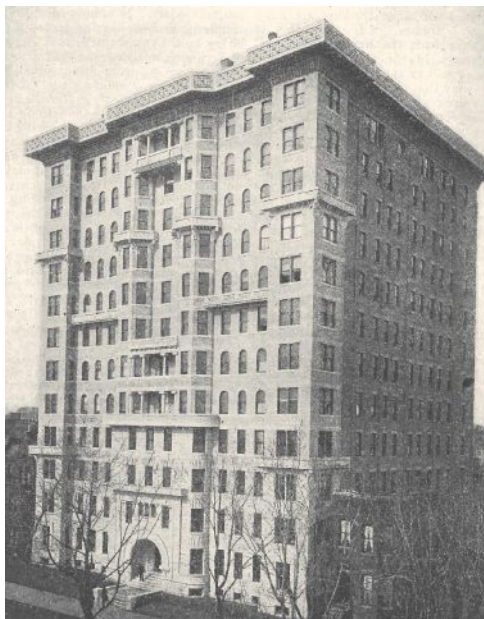
Sturgis's negative critique of Frank Lloyd Wright's Larkin building in Buffalo stands out as an aesthetic diatribe (April 1908). He also relied on a compositional reading, using only photographs, since he, an aging critic, was too sick to visit Buffalo. Wright's innovative skylit interior needed to be experienced in person: its architectonic play of mass, void, and space was never described by Sturgis. At least *RECORD* published interior photographs in the critique and Wright's own extensive presentation of his philosophy and work a month earlier.

While some architectural journalists traveled in those days—to Chicago to visit the World's Columbian Exposition in 1893 and see the latest skyscrapers there—*RECORD* writers stayed close to their New York base. The metropolis was undergoing a major transforma-

**“The [Cairo] is a box, and the combined owner and architect has done nothing to mitigate its boxiness.”**

tion, and, as tall buildings zoomed up, the critic's viewpoint changed: he or she could examine them from afar, mid-distance, or close up, as did Schuyler in writing about the Woolworth Building (February 1913). He commended its design, by Cass Gilbert, for the Gothic-style vocabulary in which crenellations and gargoyles gave the 792-foot-high tower a sense of scale in relationship to the entirety and to the human body.

During that time, “Architectural Aberrations,” unsigned denunciations of eclectically styled structures, spiced up the magazine's pages. A scholarly analysis later attributed the 26 essays to Schuyler, based on writing style. About the 12-story Cairo apartment house in Washington, Schuyler wrote anonymously, “The building is a box, and the combined owner and architect has done nothing to mitigate its boxiness. Upon the whole, we decidedly prefer the side, where he has not pretended to do any architecture, to the front, where he has made his unsuccessful pretensions in that direction” (March–June 1895). The



**PROPRIETY AND PROPORTION:** Montgomery Schuyler anonymously castigated the Cairo apartment house in Washington, D.C., for its banality in *Record*, 1895 (top, left). Russell Sturgis praised the propriety of New York's 54th Street townhouses in 1900 (top, right). Schuyler approved of Cass Gilbert's use of Gothic vocabulary, because of its sense of scale, for the 792-foot-high Woolworth Building in 1913 (above, left and right).

last “Aberrations” was published in April 1912, and critiques in general became rarer as *RECORD* turned more and more to straight reportage of design, history, and techniques.

Although Sturgis called the Larkin Building “ugly,” *RECORD* early on devoted several articles (in addition to the extensive presentation in March 1908) to Wright's revolutionary sense of space and his blurring of the boundaries between inside and out. This kind of exploration

of modernist principles continued during the next few decades, complemented by its increasing coverage of European architects' open-plan and functional precepts. Editorial pages brought increased attention to spare, unornamented, efficient design defined by improvements in materials such as concrete, steel, and glass. In the 1930s, under the influence of managing editor Lawrence Kocher, *RECORD* increasingly published expository



**DENSITY'S DILEMMAS** In *Record*, Lewis Mumford criticized the increasing chaos of cities such as New York (above and left). He also argued against the trend for corporations to move to the country, as evidenced by SOM's 1957 Connecticut General Life Insurance Company Headquarters (bottom).



articles on new building techniques, modular housing, and community planning (for more details about the architect and editor Kocher, see April 2016, page 46).

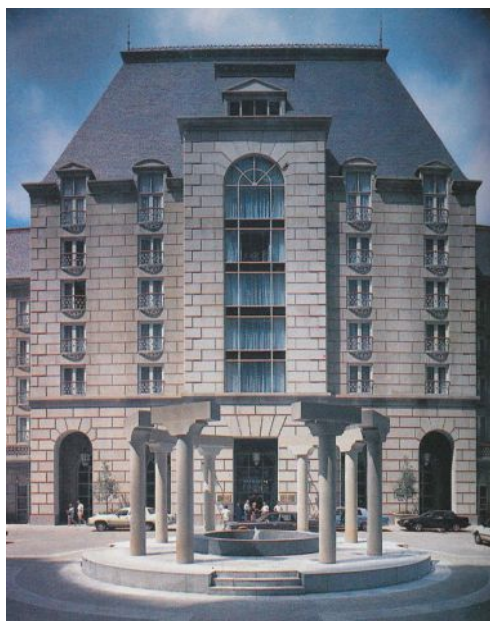
In those years, criticism did not stop, but the strong pro and con assessments were harder to find. As Goble would later point out in his July 1966 essay, the growth of the advertising base in the early 20th century, which valued circulation figures among practicing architects, spurred a shift from the lay audience to a professional one. Goble argued that *RECORD*

benefited from the increased use of photographs, plans, and sections rather than the "more limited ideas of criticism." In another essay in that anniversary issue, he contended that the selection of projects was a better form of criticism than the "fireworks of really negative attack." Editors exercised critical judgment in their selection: "Every building that is published—good, bad, or indifferent—involves some element of criticism."

Mildred Schmertz, editor in chief of *RECORD* from 1985 to 1990 (and on the staff for 33

years), wrote an article for *Harvard Design Magazine* in 1996 explaining why *RECORD* avoided those critical fireworks. "There was so much competition among architectural magazines to be the first to publish a 'high-profile' project," that "the architect will pick the magazine he wishes the work to appear in and withhold the graphics [plans and sections] from the competing media." During most of Schmertz's years with *RECORD*, there were four architecture magazines, each with its own identity: *Architectural Forum*, which was known for its urbanistic hew; *Progressive Architecture*, which forged a strong reputation for publishing avant-garde design; *The AIA Journal*, which featured education and practice articles as well as pieces about other topical concerns; and then *RECORD*, known best for a thoroughgoing coverage of state-of-the-art design and technical matters.

In spite of a certain reluctance to antagonize architects, *RECORD* still welcomed screams from the outside world. The famed public intellectual and architecture critic for the *New Yorker*, Lewis Mumford, brought a new kind of evaluation to *RECORD* in midcentury. Instead of just looking at a building as a composition, he placed architecture within the larger context of regional and city planning, urban design, and housing. In a series, "The Future of the City," published in installments in 1962 and 1963, Mumford lambasted architects for creating taller and taller buildings and in-



**PAST/FUTURE TENSE** In 1986, Michael Sorkin criticized the Crescent (above) in Dallas by Johnson Burgee Architects for being a “historical grab bag.” In 2015, he defended MAD Architects’ proposals for the Lucas Museum of Narrative Art in Chicago for its tensile quality (right).

creasingly referred to the city as “an amorphous, overmechanized, urbanoid mass, lacking both esthetic identity and social character” (November 1962).

Mumford advocated strong urban planning—but not the sort propounded by Jane Jacobs, a former editor at *Architectural Forum*, who published the supremely influential book *The Death and Life of Great American Cities* in 1962. Mumford berated her for having a “pathological aversion to good urban design” (October 1962). “In order to avoid officious municipal demolition and regulation, she would return to Victorian laissez faire; in order to overcome regimentation, she would invite chaos,” he wrote. “She lacks an image of the modern city.” *RECORD* went on to commission more articles with a polemical tone. In December 1972, Michael Sorkin, who had just received his M.Arch. from M.I.T., wrote an essay, “Radical Alternative,” on the concerns of his generation: “A thoroughly radical position takes issue not with the form of the object . . . but with the process that generated the decision to make and use it.” Practitioners should be interested in “process not product,” Sorkin emphasized.

If *RECORD* was still reluctant to criticize architects who might get angry and withhold drawings in the future, it nevertheless gave Sorkin a platform in September 1986 to take apart the recent work of Philip Johnson and his partner John Burgee. Writing on the



Crescent, a mixed-use development in Dallas, Sorkin demonstrated a pithy irreverence toward Johnson’s modus operandi: “No need to undergird formal enthusiasm with theory or relevance, to struggle for elaboration: the historic grab bag yields images for any occasion, an endless series of snapshots, history without memory.” Sorkin’s criteria for judging architecture, like Mumford’s, involved an urbanist viewpoint, if with a more subversive

## Michael Sorkin called Philip Johnson’s Crescent in Dallas “history without memory.”

tone. Compared to the theory rife in the pages of academic architectural journals during these years, where key concepts such as semiotics, structuralism, and deconstruction were bruited about, Sorkin’s language was always lively and lucid.

Sorkin’s essays still appear in *RECORD* (page 00). At one point, Robert Ivy, the editor in chief from 1997 to 2010, assigned alternating monthly columns to him and to Robert Campbell of *The Boston Globe*. Other critics, such as Sarah

Williams Goldhagen, have been enlisted to write under the current editorship of Cathleen McGuigan.

Last year, *RECORD* gave space to a spirited debate between Sorkin and Blair Kamin of *The Chicago Tribune* on a controversial proposal to build the Lucas Museum of Narrative Art on a prominent lakefront site in Chicago. When Beijing-based MAD Architects proposed a white, undulating scheme for the museum, Sorkin praised it for being “evocative of the light, simple, tensile structures of a Frei Otto tent” (January 2015). Kamin shot back in an essay in the next issue, including Sorkin in the group of Lucas museum proponents who “want to party like the recession never hit. Superrich clients! Icons! The Bilbao effect!” (The irony of including Sorkin in the crowd he so long impugned was not lost on certain readers.) Kamin hated the scheme for its misplacement on an “overburdened stretch of lakefront . . . fouling it with new levels of crowding and congestion.”

The Lucas Museum has now folded its tent and left Chicago, but the debate was healthy, no matter which side you took. While the architecture community may wonder if criticism is disappearing (along with print magazines and newspapers), there are, fortunately, strong and informed voices today, on paper and online. And the critical discussion can only be good for the profession and the public. ■

# You should see what we can do.

It's coming...  
**9.30.2016**

**SteelDay**® is your opportunity to interact, learn, and build with the U.S. structural steel industry.

Plan your **SteelDay**® visits at [www.SteelDay.org](http://www.SteelDay.org) and see firsthand how structural steel can benefit your next project.

Vote for your favorite steel building projects for our **People's Choice Award!**

During the week of SteelDay®, you have the power to choose which project among this year's IDEAS<sup>2</sup> Awards competition entries deserves recognition for excellence in steel-framed building design.

Learn more about the competition at [www.aisc.org/ideas2](http://www.aisc.org/ideas2).



There's always a solution in steel.

American Institute of Steel Construction  
312.670.2400 [www.aisc.org](http://www.aisc.org)



@aisc



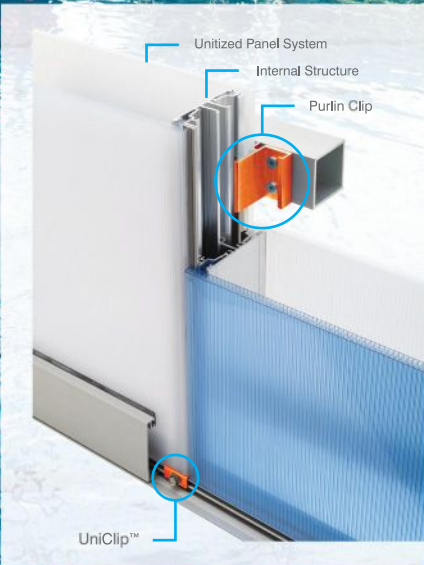
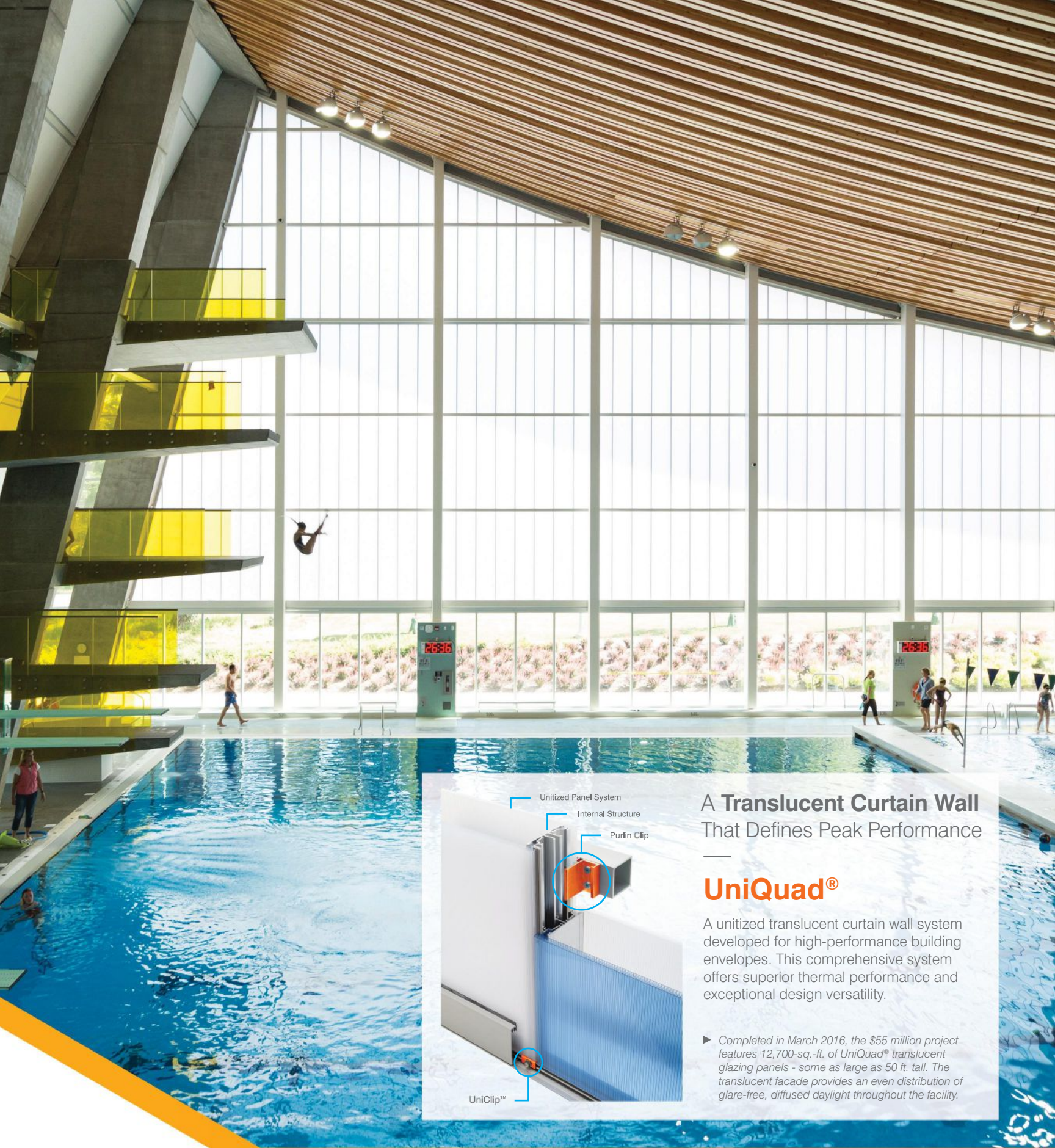
/AISCdotORG



/AISCsteelTV



@aisc



## A Translucent Curtain Wall That Defines Peak Performance

### UniQuad®

A unitized translucent curtain wall system developed for high-performance building envelopes. This comprehensive system offers superior thermal performance and exceptional design versatility.

► Completed in March 2016, the \$55 million project features 12,700-sq.-ft. of UniQuad® translucent glazing panels - some as large as 50 ft. tall. The translucent facade provides an even distribution of glare-free, diffused daylight throughout the facility.

Grandview Heights Aquatic Centre | HCMA Architecture + Design | Surrey, BC | © Ema Peter Photography





Look beyond the surface. See the possibilities.

# New dECOLeather™

RECYCLED LEATHER VENEER by FORMICA GROUP



5620-15 Fire

## Introducing dECOLeather™ Recycled Leather Veneer

Richly-grained, recycled real leather veneer in distinctive textural finishes of crocodile, walrus and buffalo. A truly uncommon sense of luxury that draws the eye beyond traditional surfacing. Durable, desirable and unlike anything you've seen from us before.

Download the 2017 Formica® Specialty Collection Lookbook at [formica.com/specialty2017](http://formica.com/specialty2017).

Formica® Surfaces. **FOR REAL.™**

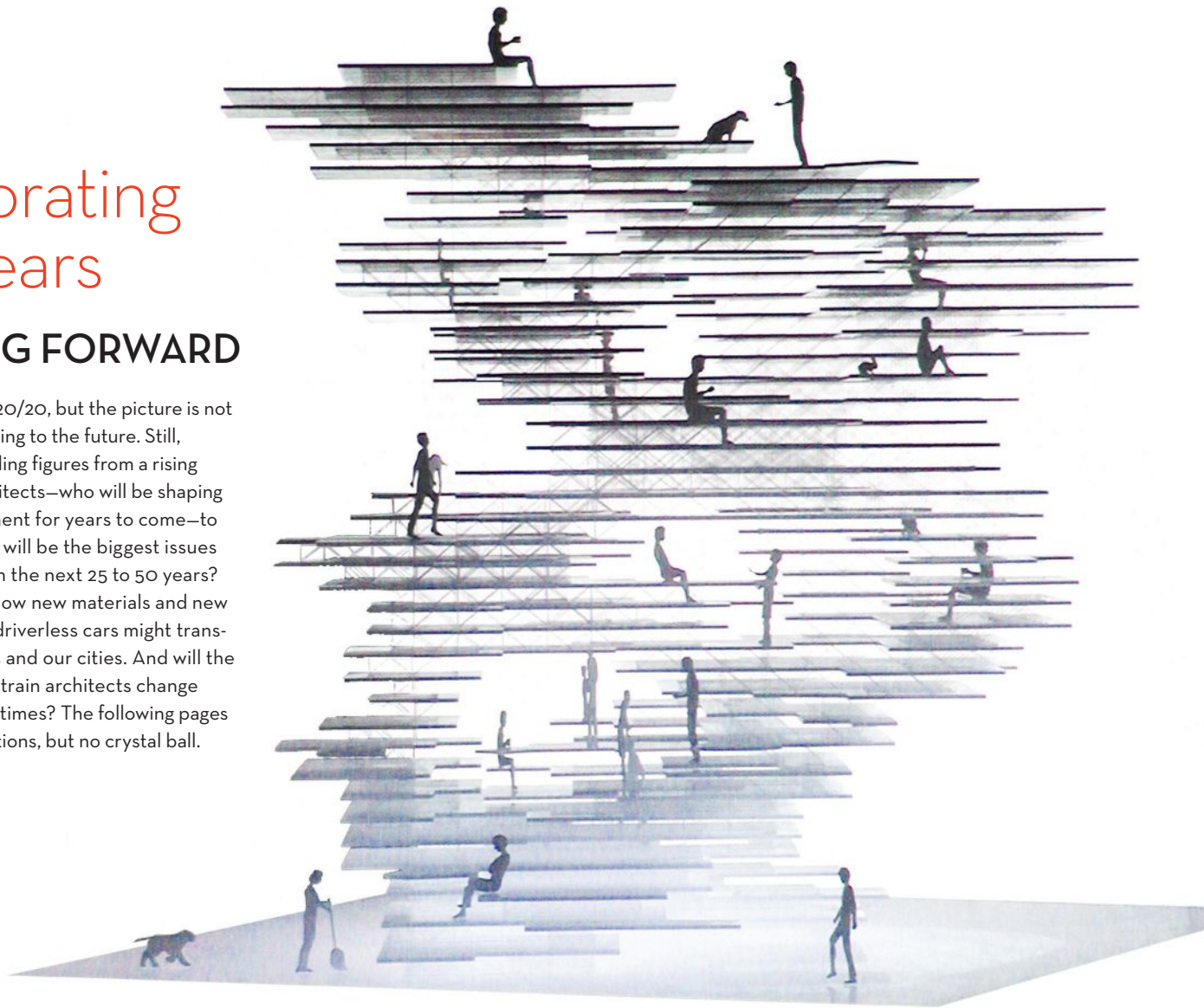
Formica® and the Formica® Anvil Logo are registered trademarks of The Diller Corporation. All rights reserved. © 2016 The Diller Corporation. A member of the Fletcher Building Group.

**CIRCLE 99**

# Celebrating 125 Years

## LOOKING FORWARD

Hindsight may be 20/20, but the picture is not so clear when looking to the future. Still, RECORD asked leading figures from a rising generation of architects—who will be shaping the built environment for years to come—to do just that. What will be the biggest issues facing architects in the next 25 to 50 years? We also address how new materials and new technologies like driverless cars might transform our buildings and our cities. And will the way we teach and train architects change with the changing times? The following pages offer some predictions, but no crystal ball.



# Visions of the Future

A group of prominent architects discuss their forecasts for the decades ahead.



**PATRIK SCHUMACHER**

Zaha Hadid Architects  
London

**MY PHRASE** for the civilization we now live in is post-Fordist network society. Architecture needs to converge around ideas for this new era—the paradigm of parametricism—as it did around Modernism in the 20th century. We need to enhance the capacity of the discipline, not only in terms of technological sophistication, but also by taking a more scientific approach with respect to social processes.

Cities will be the superbrains of our civilization. Enhanced research-and-development activity means that people will have to network and communicate all the time, and so we will make cities that are dense, open, permeable, and mixed. Each building is a device that invites, structures, and frames interactions, and so the primary task of future architects will be communication design. At the same time, the division of labor into specialisms will continue. Architects will be in charge of the overall layout, aesthetic articulation, and semiology of a building, but they will distribute

all technical elements to others, including engineers, programmers, and contractors.

If the core competency of architects is to translate the life process of an institution into space and form, and to make sure that the final product communicates as expected, architecture must develop a more sophisticated

for artificial intelligence in the creation and operation of the built environment, and the emergence of responsive environments—intelligent buildings that can signal dynamically what is going on within. This expands the communicative potential of architecture, and also feeds hard data back into an enhanced disciplinary dis-

“We will see the emergence of intelligent buildings that can signal dynamically what is going on within.”

account of the built environment as a system of signification. For that, we need to upgrade the discipline’s intellectual capacity. Architectural theory will need greater rigor, like that found in economics or the social sciences, and it will need to flow more directly into the work of the practicing architect.

We will also see a greater role

course. That will challenge a purely intuitive architectural approach. Architects need to keep pace with advances in knowledge; otherwise, they will lose responsibility. If the discipline of architecture is successfully upgraded, I foresee a growing demand for architectural skills, as design contributes an ever-greater part of a building’s value.



**ODILE DECQ**

Studio Odile Decq  
Paris

**THE WAY** we practice architecture will be totally different in the future—not just because tools and contexts change, but because the young people studying today are absolutely different from my generation.

First, there are the number of women entering the profession. There are now more female students in architecture schools than men. This will alter the profession because women don’t manage their time, or relate to the client and architecture, in the same way as men. At the moment, there are not many women running offices,

but in the next 25 years, they will be there.

Another factor is that today’s young people don’t want to be salaried employees. They want their own companies. They want to learn by doing, to be hands-on in making things. They are highly adaptable and think in terms of individuals and small groups’ sharing a platform. Big firms have to be very structured, like a machine, and we know that big machines are not efficient anymore. A two-person start-up can invent a new way of doing things. It has to happen in architecture.

In the school I founded, Confluence, I push the students to be entrepreneurial. That doesn’t mean they will necessarily build buildings. When you are educated in architecture, you are able to face very complex questions and work at many scales. It’s a unique way of thinking. We could apply it to many problems in commerce and society. Some companies are already involving writers, anthropologists, and philosophers to help them to think differently and evolve their business. Why not architects?





### DAVID ADJAYE

Adjaye Associates  
London

**WE FACE** a new challenge as architects, learning who will be in the driver's seat in the shaping of our cities as they evolve. The private sector has jumped into what formerly were the arenas of the government and local authorities. For example, we're at the edge of seeing how transportation and infrastructure will change over the next 25 years. It most certainly will not look the way it does now. One area that will need policy and will not be led by the private sector is housing. As urban populations explode, we have

## “We're on the precipice of reimagining the city and how it serves its citizens.”

to get ahead of housing.

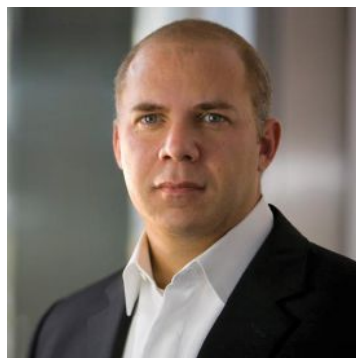
Incredible things are right at our doorstep, and they will have a powerful impact on urbanism and architecture. We're on the precipice of reimagining the city and how it serves its citizens. This

offers opportunities for new typologies, and for being able to think in a more avant-garde way about what the public needs and how to maintain the identity of a city. This is going to be at the forefront of our agenda.



### ADRIAN SMITH and GORDON GILL

Adrian Smith + Gordon Gill Architecture, Chicago



**IN TERMS** of tall buildings, there will always be people who will want to go higher. We are reaching a point, however, where it is economically unfeasible, despite being technically possible. Our firm has designed a mile-high tower that could get built, but it probably will be a losing financial proposition.

While supertall towers often become national symbols, their value extends beyond their country's borders. Eventually the

whole industry benefits from what we've learned. Take glass, for instance. We can now build glass walls that are stronger than concrete block. And while we were at Skidmore, Owings & Merrill, we designed a positive-energy building, the Pearl River Tower, which would have produced more energy than it consumed, but the Chinese power grid was not capable of accepting the power generated by the building. Someday, that won't be the case.



### BJARKE INGELS

Bjarke Ingels Group  
Copenhagen & New York

**THE TECHNOLOGICAL** revolution that has propelled Silicon Valley is almost exclusively focused on the virtual world. Looking ahead, I think we will see more advances in the physical realm, from driverless cars to solar infrastructure to new building materials that could totally transform architecture.

Already, nanotechnology is giving us a handful of carbon materials with almost magical properties. Take graphene, which is a monofilament carbon material that is 200 times more conductive than copper, 100 times stronger than steel, and more transparent than glass. It's even potentially abundant. It's just becoming available at the manufacturing level, and I believe it will become commercially available within a decade. It's so much better than anything we know today. It can be used to

create completely transparent window photovoltaics, and spans and dimensions that seem like magic. Nanotechnology gives us possibilities that we could only dream about.

We will also see 3-D printing at an industrial scale. Computer programs have enabled architects to design with great precision and complexity, but at the end of the day, designs have to get built. When 3-D printing becomes fully commercially available, it will create amazing new opportunities. Instead of having to schlep a lot of materials to a site, you will bring a handful of printers and print the building components, all of which will be incredibly strong. Any architectural form will be not only possible but also financially feasible.

I foresee architects' getting more involved in the “back of

house” aspects of a city too—all the infrastructure that makes a city work. There is still a divide in the built environment: building types that are “deserving” of architecture—like cultural venues, corporate headquarters, and luxury condos—but what about the power plants, the waste-management facilities, the water-purification plants, the parking garages, the highways? All of those are seen as engineering challenges, with little thought put toward how to integrate them into the urban environment. These facilities can make a positive contribution to a city. One of our current projects, a power plant in Copenhagen, will have an alpine ski park on its roof. It will open in 2017. We are very interested in finding ways to turn infrastructure into a positive contribution to the urban landscape.



### ALEJANDRO ARAVENA

Elemental  
Santiago, Chile

**WE ARE** living in an urban age. People are moving to cities for opportunities for jobs, education, health, and other basic services. And cities have the critical mass for knowledge creation, something that will be more crucial in the development and formation of wealth in the broadest sense of the word.

The problem is what we call the “3S menace”: the scale, speed, and scarcity of means with which to respond to this phenomenon. There is no historical precedent. Out of the 3 billion people living in cities today, 1 billion are under the line of poverty. By 2030, out of an anticipated 5 billion city dwellers, 2 billion will be under the poverty line. That means we will have to build a 1 million-population city per week over the next 15 years.

If we don’t solve this equation, people will not stop coming to cities. They will come, but will live in awful conditions. The result will be a humanitarian and health crisis rife with social friction—a crisis that will become in the mid-term, if not the short-term, a security threat.

We do not have enough knowledge to solve the 3S menace. Even if we had the tools to solve it, we would end up creating an environmental crisis.

The carbon footprint, the water consumption, and the undesired emissions to build for 1 million people a week, using current building techniques, will end our planet.

President Obama and U.N. Secretary General Ban Ki-moon, have said that the future terrorist threat will be the consequence of climate change. The 3S menace is an environmental, political, and social problem. And it’s a problem for everybody, not just the developing world.

Thanks to design’s power of synthesis, architects have the opportunity to translate into form all of the conflicting forces at play and provide solutions for the complexity of contemporary society. In front of these challenges, we need to be creative enough to identify strategic opportunities and translate them into proposals and projects of public space, public transport, multitask infrastructure, open incremental housing. With good design, the involvement of patient capital—that looks for predictability more than profitability—and the right rule of law could turn cities into a vehicle of development.

These issues are difficult—and difficult questions require professional quality, not professional charity.



### TATIANA BILBAO

Tatiana Bilbao Estudio  
Mexico City

**ARCHITECTURE HAS** the tools to improve quality of life for real people, but only if we integrate the needs of real people into our work. The future needs to be more about the informal production of architecture, not architecture for architecture’s sake. Just as urbanism has to integrate the ways that cities grow organically, architecture has to integrate the ways real people decide to create their homes. I think a lot about alterity—which in architecture would mean integrating “others” into how we practice. There have been starts in that direction, but I haven’t seen anything that I think really nails it. I don’t think it’s easy. But I hope that it can happen. Otherwise, there’s no future for architecture. The profession will cease to exist.



### TOSHIKO MORI

Toshiko Mori Architect  
New York

**WE HAD** a client who ended up with less space than he originally thought he needed because the house we designed had expansive views and an amazing quality of daylight. The idea was to get closer to nature, to experience those external phenomena. And for that, what matters isn’t the quantity of space but the boundary condition, and open and flexible arrangements. With a better boundary condition, the space one actually occupies can be more intimate.

Throughout most of history, architecture has been about

nature in opposition to the man-made environment. But there is a gradual shift with new technology and new attitudes that seek closer alliances. I have a theory that two 20th-century inventions changed our understanding of inside and outside. One was the X-ray, which made it possible to see inside the body, and the second was psychoanalysis, which allowed us to explore the internal mechanisms of our mind.

Since then, we have been trying to lessen the boundary between internal and external

conditions. The idea and the degree of enclosure needed, both physically and psychologically, has changed. Now that we can do more with less material, with high-performance enclosures getting thinner and lighter, we can embrace natural elements. By incorporating natural ventilation and sunlight—by working with and not against the forces of nature—our buildings become more sustainable. These trends, of needing less space and less separation from nature, will continue as technology advances and our perception enlightens.



## DÍEBÉDO FRANCIS KÉRÉ

Kéré Architecture  
Berlin

**DESIGN THAT** really serves—that is the most pressing issue architects should be concerned with in the next few decades. As our global population continues to grow, the need for high-quality but economical buildings will become even more critical. We need to create great architecture that serves humanity; we need to build with purpose. Architecture should inspire, it should evoke emotions. In a remote village, a beautiful building can help challenge people's perception of what is possible. You give them inspiration and hope.

When working in underserved communities, we need to be careful that low-cost does not mean cheap. Architecture, whether in a city or a rural area, needs to last. I

**“The need for high-quality but economical buildings will become more critical.”**

think one solution is to use more local materials in innovative ways. In my work, we are pioneering new methods for utilizing brick and other natural resources. By incorporating native materials, we cut down on transportation costs, support the local economy, and

create architecture that has an authentic connection to its context. If you are constantly bringing in materials from faraway locations, you will never be able to meet the worldwide demand for high-quality and enduring shelter.

We always need to remember that good architecture takes time. It's about learning local realities, studying climatic conditions, and then working with the community to create a successful design. In the African context, I cannot afford to be too quick or “fashionable.” If you take this approach, you will destroy more than you create, and communities will turn their backs on architecture. We should take care never to neglect the foundation of architecture: to serve humanity.



## GREGG PASQUERELLI

SHoP Architects  
New York

**THE PRACTICE** of architecture is going to change. Architects will reverse slide from their specialization in aesthetics and reclaim their expertise in problem-solving. We will need to be broad-minded generalists, and firms will need to have a more expansive view of what architects can do. We can combine art and technology, and do it in a way that solves real problems.

Our firm is continuing to research what building a city means, and not forgetting the artistic side, while capitalizing on

technology. How can we create areas with density, links to public transportation, spectacular public spaces, and an inclusiveness that embraces many kinds of people? How can we create higher-quality buildings, with better performance, that don't cost an arm and a leg? The most sustainable thing is not an array of photovoltaics on the roof; it is a building people love and care about and don't have to renovate every 20 years. If we can do all of this successfully, we can make a huge difference.



## SHOHEI SHIGEMATSU

OMA  
New York

**IN THE NEXT** 25 to 50 years, responding to food at its diverse scales and its different processes will catalyze new architectural typologies. Food is specific to livelihood, to the soil, and to culture—and yet it is also expansive and global. From large urban developments driven by food production to local cafeterias and home kitchens, food has the unique ability to be multi-scalar. It also goes through many stages, from planting to harvesting to processing and ultimately to waste, yet no comprehensive survey of this full food chain exists. I am leading a studio at the Harvard GSD that is investigating the intersection of food, architecture, and urbanism.



## JEANNE GANG

Studio Gang  
Chicago

**WE NEED** to promote social connectivity in ways that will keep our cities safe and livable. I fear that with greater wealth disparity, we are losing connections between people who come from different walks of life. I'm optimistic that architecture can find ways to reconnect communities. To do that, architects will need to be more engaged with the public and will need to find ways for people to become active participants in designing their environments. Public engagement is not something we're taught to do in architecture school, but we need to learn it.

We are also going to have to

rethink our civic assets—including police stations, libraries, community centers, and even streets—and redefine what they are in order to get the most out of them. A library can become a place to get job assistance or mental-health services. A police station could also be a community center. We're going to have to reinvent all of these things, and think of ways they can be networked together. A city that is more cohesive will be more resilient, even regarding climate change. When things start happening, we're going to have to take care of each other. And to do that, we have to know each other.

**GREG LYNN**

Greg Lynn Form  
Venice, California

**THE FUTURE** of architecture is figuring out what happens where the physical and the digital intersect. Buildings are becoming smarter and more networked. Yes, some of the “smart building” technology starts out benefiting the rich—as toys to entertain wealthy consumers—but it will eventually reach many more people.

I recently visited the Villa Tugendhat, in Brno. I went expecting to see really cool Mies. I found myself fascinated by the air conditioning. The whole facade of sliding glass disappears into the basement. The slot where it goes is a giant diffuser, and in the basement there’s a rudimentary cooling system, with these four bins of wildflowers. Throughout the day, cool

“In a few years, construction workers will be wearing goggles preloaded with information provided by architects.”

air with different scents blows through the house. I was amazed at all the technology cooked up for this one family. Yes, it was superbourgeois, but that stuff trickles down eventually.

So buildings will change, in ways that no one can predict exactly. How buildings are delivered will change in ways I’m much more certain of. I’ve had the opportunity to work with the HoloLens, which are glasses that project augmented reality

onto whatever you’re looking at. It’s not virtual reality, which I hate, but something much more useful. Put them on at a construction site, and you see what you’re supposed to be building. And as you move your head around, you’ll see it in 3-D. In a few years, construction sites will be paperless. The workers will be wearing goggles preloaded with information provided by the architects. I’d bet the farm on it.

**MENG YAN**

URBANUS  
Shenzhen, China

**I’M ALWAYS** hesitant to predict the future. We see the future best from the perspective of history. Looking at China, I think there are still lots of opportunities. Every second- and third-tier city here wants to be Shenzhen, to grow very fast. But we’re using the same set of tools to plan our cities that we did 25 years ago. We need new methodologies. Instead of building new cities, though, we should go back and rebuild the ones we have. I’d like to see the new city built on top of the existing one.

Architects must change too. Traditionally, we would wait to get a commission and then provide a service. There are other ways to practice, though. We can go out and find our projects—research where we live and work, and find problems that require solutions. This means identifying key moments where we can intervene and make a difference. It means actively engaging with our cities. Right now URBANUS is working with a community in Shenzhen that is being threatened by

development. It’s actually a 500-year-old village in the middle of a city that everyone says is just 36 years old. It has been there for hundreds of years, changing all the time, and is now surrounded by a giant new city. We used social media to reach out to people living in this urban village, as well as to architects, planners, and researchers. It’s very powerful. We couldn’t have done this five years ago.

People in China continue to move from the countryside to the cities. But a lot of work needs to be done in rural areas. The countryside has always nurtured our culture; it’s where our poets, painters, and philosophers went to find inspiration. In the Confucian system of governance, smart kids from the countryside would take the exams, go to the cities for education, and get posts in different places. But they always came back to the countryside. We need to do that again—to bring people back to the villages, not just as tourists, but to live there and contribute.

**SOU FUJIMOTO**

Sou Fujimoto Architects  
Tokyo

**IN THE FUTURE**, biotechnology will allow us to blur the line between the natural and the man-made. I can imagine structures that are half grown and half built. We could not say that buildings contain plants, because buildings and plants would grow together: the process of building and growing would be fundamentally the same. I think this would completely change our understanding of architecture. This is my dream.

# The Road Ahead

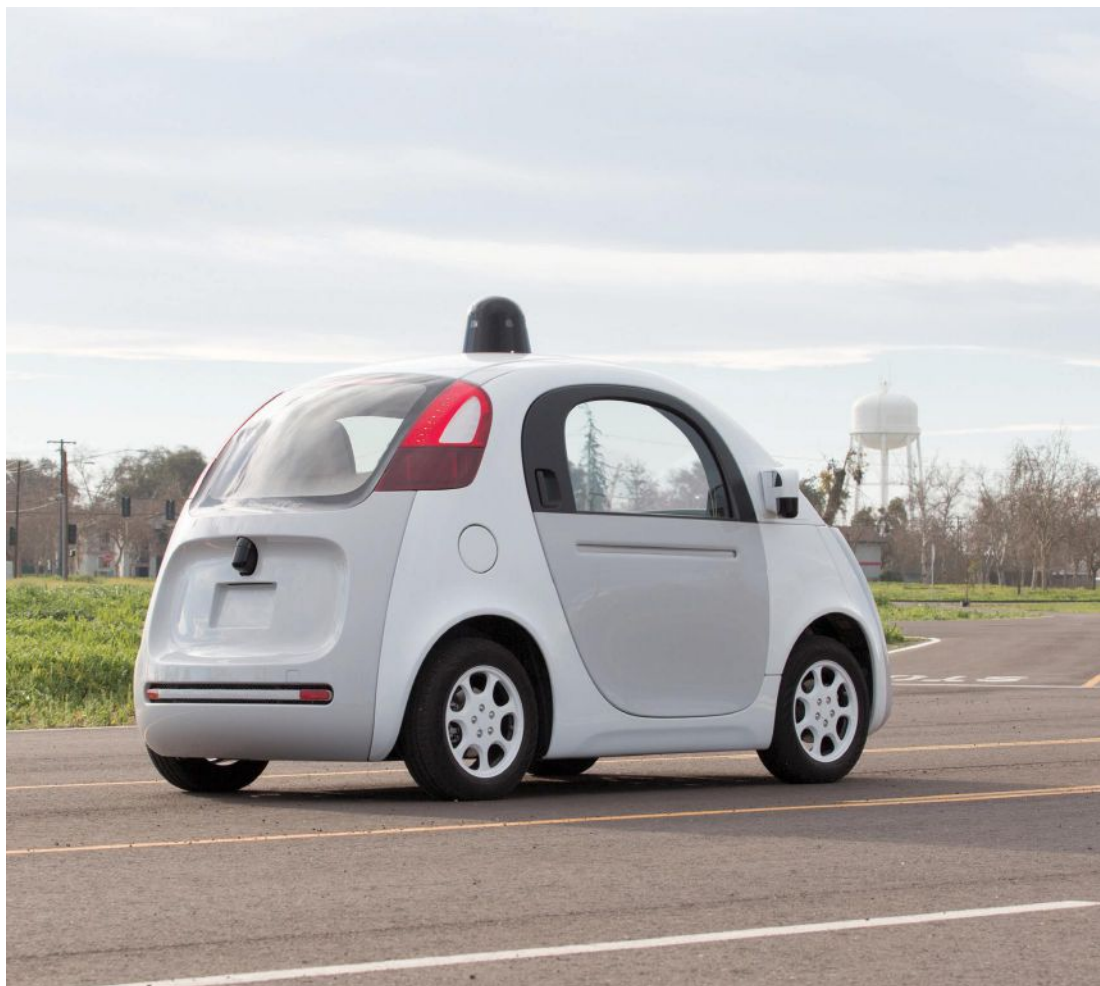
Autonomous vehicles are on their way—but what will their arrival mean for density and sprawl?

BY SARAH AMELAR

**THE RACE** to develop driverless vehicles is zooming full-speed ahead, engaging all the major car companies—as well as Google X, Apple, and various start-ups. Though schemes for self-driving date back to the 1920s, with resurgences in the '50s and '80s, this once-farfetched pursuit is attaining real-world feasibility. Google X, a leading player now known as X, has logged over 1.7 million miles in its autonomous test cars on public roads. States including California, Florida, and Michigan have enacted legislation to permit such trials. Although a recent fatal accident with a Tesla test car drew widespread attention, it was statistically an extremely rare self-driving event. In fact, the day when a phantom chauffeur will charge an electric vehicle on its own, analyze the route, exchange up-to-the-moment information with other cars on the road, and pick you up for work—or your kids for school—is no longer sci-fi fantasy. Many of the manufacturers expect fully autonomous vehicles (AVs), requiring no human supervision or backup drivers, to hit the market around 2020—letting you sleep, read, work, or entertain guests as an unmanned sedan ferries you door to door.

Meanwhile, questions are emerging about how AVs could change the form and structure of cities, towns, and roadways. Much of the research—at venues including MIT, IIT, and Carnegie Mellon University—has examined this autonomy in tandem with other evolving trends and technologies. Exploiting the joint potential, self-driving seems a natural fit with electric powering; hyperconnectivity; sharing models (as in Zipcars, urban bike fleets, and cyber-facilitated car pools); and operative algorithms, akin to the dispatch programs that optimize elevator service based on passenger destinations.

“Autonomous vehicles promise to have dramatic impact in blurring the distinction between private and public modes of transportation,” says professor Carlo Ratti, director of MIT’s SENSEable City Lab. “After taking you to work, ‘your’ car could give a lift to someone else in your family—or to anyone in your neighborhood, social-media community, or city—rather than sitting idle.” While the average automobile in the U.S. is unused an estimated 95-percent of the time, a

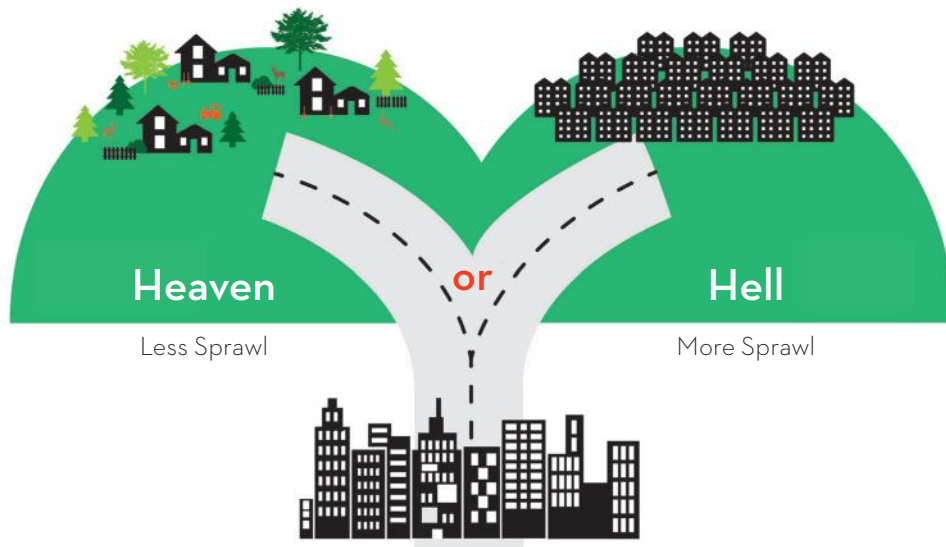


**DESIGNATED DRIVER** Google X (now known as X) runs a driverless test fleet that currently consists of 24 modified Lexus SUVs, as well as 34 prototypes (shown here) without steering wheels or brake and gas pedals.

robo-vehicle has the potential to reposition itself continually, with network-optimized efficiency, from one passenger to the next. Theoretically, self-driving could lend everyone—including the blind, elderly, and very young—unprecedented mobility, providing a shared system of individually customized, on-demand travel with a fraction of the cars currently on the road.

A major consequence could be a radical reduction in parking space. And slots could be packed tight, given robotically nimble maneuvers, not to mention the area saved when no one needs to exit or enter a parked vehicle—ever. (After dropping you off, the car would

“valet” itself.) Even curbside spots could become unnecessary, allowing for narrower streets—an efficiency boosted by sensing-and-reaction mechanisms that permit AVs close driving distances, increasing road capacity. The gains could be huge. As Ratti puts it, “Parking infrastructure in the United States covers around 5,000 square miles—an area [43-percent] larger than Puerto Rico.” The freed-up land could be converted to creative and socially enriching uses, providing for art or recreation—as demonstrated temporarily on international Parking Day, or more permanently through initiatives in cities that include Seoul. Such reclamation opportunities, how-



MIXED BLESSING A driverless revolution could increase urban density or, conversely, suburban sprawl—or both.

ever, only apply where parking occupies open lots or dedicated structures.

Self-driving could also fundamentally change intersections and traffic signals. A recent MIT study proposed an air traffic–inspired slot system that dispenses with traffic lights and stop signs. Instead, vehicles communicate electronically, enabling them to cross intersections safely without stopping or idling, thereby improving traffic flow and energy expenditure.

But predictions vary. John Eddy, an Arup principal who advises municipal transit agen-

cies and other clients on the planning implications of self-driving, cautions, “There’s an expectation that a huge amount of land will come available thanks to driverless cars—but not so fast! We can’t wipe the maps entirely clean of parking, and one great unknown is the space needed for all the pickups and drop-offs. Besides, public policy will play a significant role in how the land actually gets reallocated.” As for the communal aspirations for AVs, he points out that extensive ride pooling is possible today, even without automation,

#### JOY RIDING

Self-driving was once a pie-in-the-sky pursuit, as suggested by this late ‘50s image, created for an electric company advertorial.



ELECTRICITY MAY BE THE DRIVER. One day your car may speed along an electric super-highway, its speed and steering automatically controlled by electronic devices embedded in the road. Travel will be more enjoyable. Highways will be made safe—by electricity! No traffic jams . . . no collisions . . . no driver fatigue.

## Density allows for better resource sharing, but easier commutes could make suburbia more desirable.

“yet many people prefer—or can afford—not to do it,” he observes. “Yes, enthusiasm for it may be growing, but a complete transformation would require a profound societal change, as well as policies that incentivize sharing versus not sharing.”

Perhaps the most compelling aspect of driverless roads is the promise of vastly increased safety. “Statistically, the least reliable part of a car is the driver,” says Chris Urmson, who until last month headed Google’s Self-Driving Project. “And 1.2 million people are killed in car accidents every year.” By many estimates, 90 percent of them involve human error. Though autonomous driving has seen relatively few incidents, its greatest safety hurdles come in the transition window, when manned and unmanned vehicles still share the road (as with the Tesla accident in May). And AVs need further advancement to address such complications as potholes, snow, reflections, construction obstacles, bicyclists, and pedestrians—not to mention technology failures, if systems go down or get hacked.

Assuming the ongoing progress addresses such shortcomings, and policy keeps pace, it’s unclear if the new autonomy will promote urban density—or suburban sprawl. “Arguments can be built for both options,” says Ratti. As he points out, density is by nature more efficient, allowing for better resource sharing, but swifter, easier, more relaxing and productive commutes could make suburbia more accessible and desirable.

Speculative optimism pervades visions of a brave new driverless world, yet we could realize many of the forecasted benefits now, without AVs. And if parking were minimized, generating a bounty of land, there’s always a risk of development that doesn’t turn parking into parks or otherwise serve the collective good. As for increased density versus sprawl, we could conceivably end up with both. Clearly, the time has come to lay the groundwork for an AV revolution. The impact of self-driving, as Ratti concludes, “will come down to societal decisions about how we really want to live.” ■



# Material Futures

Designers and architects are going back to basics to develop an innovative palette of building blocks for generations to come.

BY BRADLEY QUINN

**MATERIALS HAVE** undergone a radical transformation. All over the world, a fresh crop of tech-savvy, socially engaged architects are seeing traditional options with new eyes. Factors such as geopolitics and mass migration are fueling demands for lightweight, labile materials, while the need for emergency supply chains requires multifunctional building blocks that can be assembled on the fly. Just as conventional resources are being rediscovered or repurposed, digital technologies pave the way for smart interiors and facades. Modern materials are no longer passive; they can function as sensory components that harvest energy, interface with their surroundings, and respond to the surfaces around them. As architects combine parametric tools and traditional craftsmanship, they are discovering materials that limit neither and sometimes amplify both.

Widely known for his preference for humble materials and appreciation of craft, Swiss architect Peter Zumthor was just one of the

participants who identified a shift toward “handmade architecture” at the International Architecture Biennale in Venice this summer. According to Zumthor, the industry is slowly returning to simple, unfinished materials such as wood, stone, clay, and thatch. Recent innovations in timber technology indicate that Zumthor is right, especially since engineered wood products such as CLT (cross-laminated timber) have evolved to become significant building materials. In the hands of Thomas Robinson, founder of LEVER Architecture in Portland, Oregon, CLT and glue laminated timber are rising to new heights as they are used to construct LFRS (lateral force resisting systems), beams, and tall columns. Robinson’s 12-story mixed-use Framework tower is slated for construction in Portland’s trendy Pearl District next year. “The post-tensioned wood rocking shear walls in the Framework project are the primary expression of the facade and drive the plan,” says Robinson. Additionally, Robinson reports that his firm’s Albina Yard



A model of LEVER Architecture’s 12-story Framework tower (above) in Portland, Oregon, which will be the tallest Mass timber project in the U.S. For an artists’ residence and cultural center in Senegal (top), Toshiko Mori created a thatch roof that captures rain and channels it into water canals to a cistern.

project in North Portland features the first structural use of domestically fabricated CLT panels in the United States.

New York architect Toshiko Mori designed a multiuse cultural center in Senegal that was completed last year (RECORD, June 2015, page 82). Grasses growing on-site were harvested

and dried to fashion the structure's sloping thatch roof, which collects rain and channels it into water reservoirs that then drain into covered cisterns. "Traditional techniques were used to make the roof," says Mori. "The materials and craft are known to everyone, so repairs can be made readily."

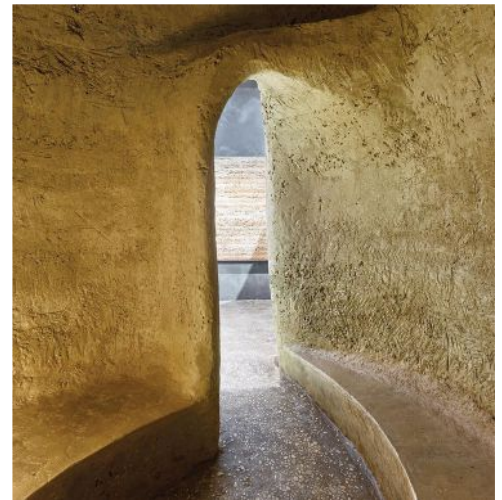
German architect Anna Heringer also turned to local resources, discovering that mud may have potential for modern structures. Heringer first used mud bricks in 2007 to build a school in Bangladesh, and today cites it as an example of a readily available global resource. More recently, the architect's installation at the 2016 Venice Biennale, which comprises 25 tons of mud from locally sourced clay, demonstrates age-old techniques viable for the 21st century: rammed earth, mud-casein wall colors, and *zabur*, a technique of shaping through layering the mud by hand.

Seaweed, too, is slated to join the ranks of grassroots materials. German designer Julia Lohmann is pioneering prototypes and installations that explore its applications for architecture and design. "As I experiment with naga kombu and other types of seaweed, I discover it has the strength and robustness typical of building materials," Lohmann says. Her experi-

ments with stretching dried seaweed over a cane frame resulted in a freestanding installation, revealing the material's potential for building temporary structures. At the same time, Danish architect Kasper Guldager Jensen, GXN director and partner at 3XN and coauthor of *Building a Circular Future*, is exploring the value of biobased building materials produced from seaweed and agricultural waste such as tomato stems and flax fibers. "Both biological and technical materials should be up-cycled," Jensen says. "Creating man-made material ecosystems is the ultimate design challenge."

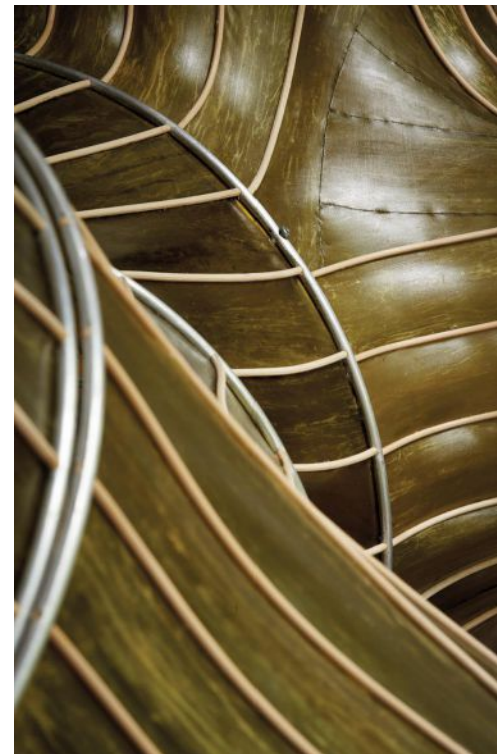
Such grassroots resources are often derived from reclaimed materials or elements created from recycled sources. Lauded for its versatility and strength, recycled paper can be used to make acoustic panels, wall and floor tiles, and load-bearing structural components. Based in the Netherlands, the designers behind Newspaper Wood reverse the norm of pulping wood to make paper: they recycle newspaper to create an alternative to wood. Lightweight and strong, the newspaper used to fabricate the material is compressed so densely that its layers resemble wood grain when cut.

Nature provided the inspiration for a modular system of building components based on



German architect Anna Heringer's installation at the 2016 Venice Architecture Biennale (above) showcases the potential of traditional building techniques with mud.

grains and granular particles. Karola Dierichs and Achim Menges, both architects teaching at the Institute for Computational Design in Stuttgart, Germany, used recycled plastic that had been extruded into pellets as raw material for the injection-molded components they designed. Their modular system of star-shaped



Seaweed is abundant and available around the world, and when dried it becomes a robust material. London-based German designer Julia Lohmann is experimenting with it (left and above) to demonstrate its capabilities for building temporary structures.





GXN director Kasper Guldager Jensen and his team explore the value of bio-based materials (left). Dierichs and Menges devised a construction system of recycled plastic components (middle). Newspaper Wood makes woodlike building products from recycled newspaper (bottom, left). Sensory skins display graphics, regulate lighting, and absorb sound at Al Jazeera's London studio (bottom, right).

granular particles can be assembled in layers to build freestanding structures without requiring binding agents, framework, or forms. Distinct Element Modeling (DEM) simulations were used to analyze the structural performance of the recycled material, revealing that the system is robust enough to create load-bearing structures without requiring any additional support.

Although technologically fuelled components may appear to be a direct counterpoint to low-tech, traditional materials, there is scope for the two to coexist. Based in Vienna, Veech x Veech integrates advanced media technologies into everyday architectural materials to create programmable surfaces and immersive interiors. Ready-made products, such as luminous textile panels, are installed alongside components crafted from acrylic-based solid surface materials developed to showcase digital images and animations. When Veech x Veech designed Al Jazeera's new broadcast studio in the Shard in London last year (RECORD, August 2015, page 131), it created sensory skins that display graphics, regulate lighting, and absorb sound. According to Stuart Veech, who cofounded the practice with Mascha Veech-Kosmatschof, "The integration of materials and technologies enabled us to blur the boundaries between the real-time, analog studio environment and immersive digital spaces, subsequently going beyond the norm of the existing black-box studio." Technologies like these can make every environment interactive, yet often rely on traditional materials to construct panels and surfaces to contain them.

New materials, whether derived from organic sources such as seaweed or fabricated from recycled plastic, will conserve resources and up-cycle waste. As such technologies are integrated into buildings, traditional materials and digital systems may converge to create responsive environments. The very same craftsmanship and conventional constituents that are highly valued today promise to play key roles in the interactive architecture to come. ■

*Author, academic, and industry strategist, London-based Bradley Quinn is an expert on emerging technology and advanced materials. His books include The Fashion of Architecture.*



# Changing Course

Architectural education is diversifying, with more options for students.

BY JONATHAN MASSEY

**WALK INTO** any of the 154 architecture schools certified by the National Architectural Accrediting Board and you are likely to encounter students working long hours in the design studio, learning their craft in small groups through desk crits and pinups. It's a scenario with roots in the 19th-century tradition of the Ecole des Beaux Arts. Combined with rigorous professional requirements, this approach makes becoming an architect an extended and expensive proposition, entailing from five to eight or more years of full-time study, with heavy course loads. Factor in internship and licensure exams and you've got an endurance course: the average time from starting a degree to becoming a licensed architect is 11 years. Architecture, and architectural education, are still to some degree a gentleman's game geared to people well endowed with time, money, and social capital.

High barriers to entry skew the demographics of architecture by steering away talent, especially among women, first-generation college students, and people from historically underrepresented ethnic groups. Recognizing this, the organizations regulating access to the profession have changed procedures. Nineteen schools now incorporate work experience and test preparation into degrees to provide an "integrated path to architectural licensure," and the National Council of Architectural Registration Boards has changed its internship requirements to recognize a broader range of activities and give candidates an earlier start.



But these are small steps, and there's substantial pressure to make the field more accessible and equitable. I see two primary methods for changing this: building new pipelines into the profession and exploiting the efficiencies of online tools.

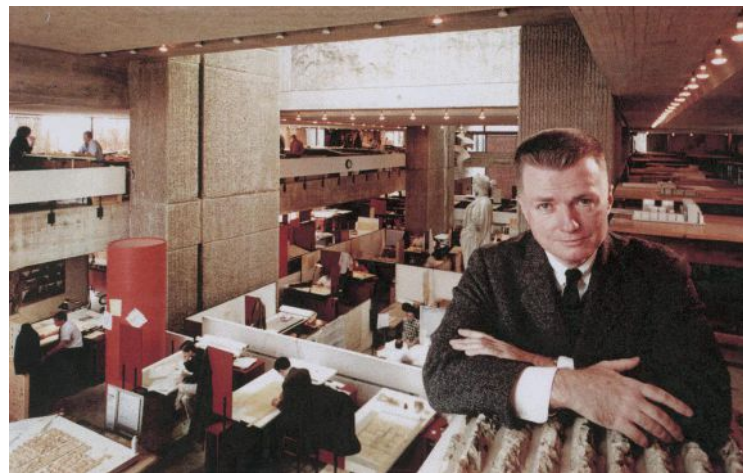
The discipline starts losing a diversity of talent early on. Having completed a study on inclusion in architecture last year, Harvard professor Toni Griffin suggests that we need to introduce the field early to future architects by

addressing middle- and high-school students from underrepresented backgrounds. To this end, the National Organization of Minority Architects runs youth summer camps and workshops through its Project Pipeline, while the University of Michigan's Taubman College of Architecture and Urban Planning has joined forces with the Detroit public schools to launch a one-semester college-level introductory program. The Equity by Design committee of San Francisco's American Institute of Architects chapter uses research and conference workshops to promote gender equity in both academia and practice.

Recruiting and retaining people who aren't interested in a gentleman's profession also requires changing curricula to foster awareness of architecture's relevance to matters of common concern. This is the work of Design Futures, an annual workshop founded in 2013 by Dan Etheridge and Barbara Brown Wilson, to train students in public-interest design, and of the Feminist Art and Architecture



**THEN AND NOW** Design studios in the early days of Columbia University's Graduate School of Architecture, Planning and Preservation, shown in Record in July 1900 (top). Now, students at the Taubman School of Architecture at the University of Michigan (left) seem more immersed in various media, if more casual in attitude.



Collaborative, a group of young historians generating teaching materials that emphasize women's contributions and the insights of feminist scholarship.

A bigger impending change is technology-driven. San Francisco's Academy of Art University, Lawrence Technological University in Southfield, Michigan, and Boston Architectural College offer accredited architecture degrees either fully or partially online, allowing students to fit education around work and family. So far, these programs generally replicate the methods and scales of on-campus education, with class discussion moving into chat forums and desk crits conducted in video calls. Across higher education, though, providers ranging from established universities to specialized for-profits, such as General Assembly, which was begun in New York, are offering new formats. MOOCs, or Massive Open Online Courses, present course materials and assignments online, with students evaluating the work of their peers. And since people need new knowledge and skills at multiple points during their careers, fields such as interaction design and teaching are issuing microcredentials—certificates recognizing that the bearer has demonstrated competency in a specific topic or expertise.

MOOCs and microcredentials have low completion rates, however; so far, in architecture, they function primarily as free or low-cost loss leaders that recruit students into traditional degree programs. But market analysts predict an “unbundling” in which students move from signing up for the degree program as a complete package finished in a short period right after high school (the traditional college-degree model) to a service consumed in different ways throughout a career. An exercise at Stanford University's d. school imagined the future university as a lifelong “open loop” between study and work, with a self-paced curriculum in which partici-

pants move forward not at set time intervals but when they demonstrate competency through exams and completed projects. Marketplaces such as LinkedIn, which use peer endorsements and other data to represent competency in specific areas of skill, may begin to supplant degrees in some fields.

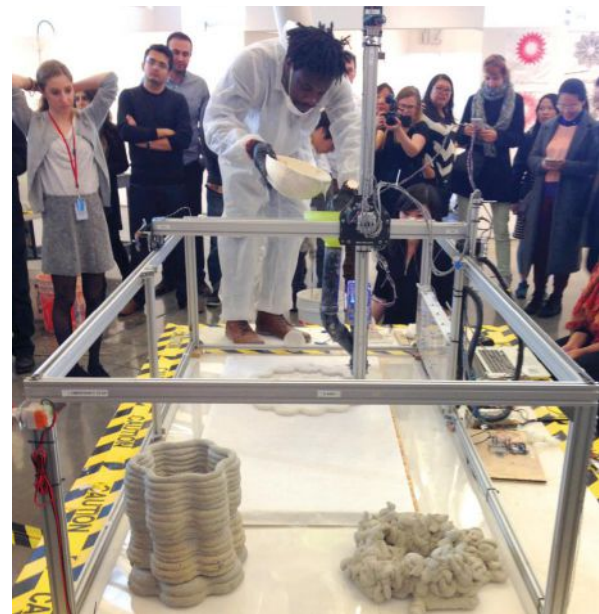
Since most architecture degrees are connected to professional licensure, these changes will be slower to affect architectural education than other fields. But we can expect many architecture schools to combine on-campus learning with online courses, allowing students to learn at variable paces and lower costs. The key to significant change is innovation in the design studio, which owes its uniquely powerful teaching to a high cost in time, space, and staffing. The information-rich, multiuser platform afforded by building information management (BIM) software suggests that cloud-based platforms can support more efficient ways to learn and to evaluate design. Architect and Yale University professor Peggy Deamer sees BIM as a framework for introducing students to architecture as a collaborative art embedded in markets for products and services. Future practitioners educated in this kind of complex and dynamic design medium may be better equipped to navigate the labor market. Ultimately, the strongest incentives for people to pursue architectural education are higher earnings and a better work-life balance.

Many people practice architecture without becoming licensed. They work in a firm with other licensed practitioners, partner with someone who can stamp drawings, or operate outside the service model embedded in AIA-approved contract documents. Some of the strongest design research in the professional and post-professional degree programs at California College of the Arts, where I am dean of architecture, comes from experimental studios that adopt tech-sector approaches. In our Creative Architecture Machines studio,

students make prototypes of automated fabrication systems for building components, generating intellectual property for commercial use rather than bespoke “instruments of service” for clients. Architecture offers ample room for innovation, not only in design but also in the models of practice and methods of preparation through which we equip students to transform the built environment.

students make prototypes of automated fabrication systems for building components, generating intellectual property for commercial use rather than bespoke “instruments of service” for clients. Architecture offers ample room for innovation, not only in design but also in the models of practice and methods of preparation through which we equip students to transform the built environment.

*Jonathan Massey is dean of architecture at California College of Arts in San Francisco and the author of Crystal and Arabesque: Claude Bragdon, Ornament and Modern Architecture (2009).*



# America's **Top** Architecture Schools 2017

Record presents the ratings of the top 10 undergraduate and graduate programs in the U.S., compiled by DesignIntelligence. We discuss some of the highlights of this year's findings. **BY ANNA FIXSEN**



**HERE'S A** professional pick-me-up: architecture is one of America's most prestigious professions—the seventh-most, to be precise. In fact, according to the Harris Poll, a whopping 87 percent of Americans would encourage their child to pursue the occupation.

In spite of that flattering public opinion, the profession still has many hurdles to vault—diversity, gender equality, long working hours, and mounting student debt, to name a few. But, to borrow the words of Le Corbusier, architecture is a “learned game,” and where that learning begins, in today's academic institutions, is ground zero for tackling some of those issues.

Fortunately, the future is looking bright: according to the latest survey conducted by the architectural-research organization DesignIntelligence, which polled more than 2,000 firms and 2,785 students, enrollment in architecture schools is steadily on the rise, in tandem with job prospects and salaries. Both firms and schools are increasingly addressing issues

**SCHOOL OF THOUGHT** Yale University, which ranked fifth on the top graduate schools list, routinely brings in renowned faculty, including Peter Eisenman, who taught an advanced studio course this spring (above).

pertaining to sustainability and climate change. The study also found that more than 90 percent of architecture students surveyed were satisfied with their education.

“When I started interviewing firms in the '90s, there was a feeling that firms and educators weren't on the same page. I don't get that sense anymore,” says DesignIntelligence's editor in chief, James Cramer. “If there is going to be a strong profession in the future, there need to be strong architecture schools today.”

Published in the following pages are RECORD's annual rankings of the best architecture schools in the United States, as well as other key take-aways from the survey.

## The Top 10 Undergraduate Programs

1	Cornell University
2	California Polytechnic State University, San Luis Obispo
3	Syracuse University
4	Rice University
5	Virginia Polytechnic Institute and State University
6	University of Texas at Austin
7	Rhode Island School of Design
8	Pratt Institute
9	Auburn University
10	Southern California Institute of Architecture

### COMPARISON OF PREVIOUS RANKINGS: UNDERGRADUATE

	2017	2016	2015	2014	2013	2012	2011	2010
Cornell University	1	1	1	2	1	1	1	1
Cal Poly, SLO	2	2	2	1	5	4	4	3
Syracuse University	3	4	5	6	3	7	2	2
Rice University	4	5	3	3	3	5	3	9
Virginia Tech	5	3	4	5	7	3	4	4
UT Austin	6	7	6	4	6	2	7	5
RISD	7	6	7	10	7	6	11	7
Pratt Institute	8	11	9	11	11	10	9	15
Auburn University	9	8	12	8	9	14	18	13
SCI-Arc**	10	12	8	8	2	7	6	-

\*Where more than one school receives the same number of votes, one of the schools will show no numerical ranking.

\*\*Programs with only a dash either did not score in the top 20 or did not have an accredited program at that time.

### The Rankings are Shifting . . . Slowly

At first glance, RECORD's 2017 rankings of America's top architecture schools do not differ dramatically from last year's. In fact, eight of the top 10 in both undergraduate and graduate categories appeared on the 2016 list. Cornell has once again taken the No. 1 position for undergraduate architecture programs, while Harvard—as it routinely has been—is the top graduate school. "It's kind of amazing that there were no big surprises," says Cramer of the results. "I call it steady and strong and fairly consistent."

But the rankings haven't been completely static. In the undergraduate survey, the Southern California Institute of Architecture (SCI-Arc) and Pratt Institute moved up into the 8th and 10th positions respectively, nudging Carnegie Mellon and the University of Southern California out of the top 10. Meanwhile, on the graduate school list, Syracuse University and the University of Pennsylvania rose to the top 10, displacing Washington University and Virginia Tech.

If you are a prospective student, however, the numbers are only one

## The Top 10 Graduate Programs

1	Harvard University
2 (TIE)	Cornell University*
	Massachusetts Institute of Technology
4	Columbia University
5	Yale University
6	University of California, Berkeley
7	University of Michigan
8	Syracuse University
9	Rice University
10	University of Pennsylvania

### COMPARISON OF PREVIOUS RANKINGS: GRADUATE

	2017	2016	2015	2014	2013	2012	2011	2010
Harvard University	1	1	1	1	1	1	2	1
Cornell University	2	2	5	5	5	6	6	7
MIT		5	4	4	4	6	5	3
Columbia University	4	4	2	3	2	3	4	4
Yale University	5	3	3	2	3	2	3	2
UC, Berkeley	6	6	10	9	7	14	10	9
University of Michigan	7	7	6	7	11	8	1	-
Syracuse University	8	11	16	-	-	-	20	19
Rice University	9	8	7	5	15	14	16	15
U of Pennsylvania	10	15	7	14	15	8	8	11

side of the coin: "The rankings are just a single perspective," Cramer says. "The most expensive schools are not the necessarily the best for you. The top-ranked schools aren't necessarily the best for you."

Indeed, school administrators rank the institutions differently from architectural professionals, according to the survey results. For graduate programs, three schools that didn't make the top 10 list (the University of Minnesota, SCI-Arc, and Princeton) were named as part of the top five most admired schools by deans and chairs.

### Trends in Enrollment and Curriculum

According to Cramer's research, schools are experiencing an enrollment uptick—albeit slight—in both undergraduate and graduate architecture programs. Over the years, he says, diversity has increasingly become a pressing issue in architecture schools. Women do make up approximately half of architecture students but, while there is plenty of room to grow, schools are making efforts to attract a more racially diverse student body. "We see [diversity] being talked about all

## Top Regional Undergraduate Programs

### WEST

1	Cal Poly, SLO
2	SCI-Arc
3	University of Southern California

### EAST

1	Cornell
2	Syracuse
3	RISD

### MIDWEST

1	Illinois Institute of Technology
2	Iowa State University
3	University of Notre Dame

### SOUTH

1	Rice
2	Virginia Tech
3	UT Austin

## Top Regional Graduate Programs

### WEST

1	UC, Berkeley
2	UCLA
3	SCI-Arc

### EAST

1	Harvard
2 (TIE)	Cornell
	MIT

### MIDWEST

1	University of Michigan
2	Washington University, St. Louis
3	University of Cincinnati

### SOUTH

1	Rice
2	UT, Austin
3	University of Virginia

the time. I don't think schools are in denial about it," he says.

New priorities are also surfacing in the curriculum. "With all the new technologies architects are using, there is a curious twist developing," says Cramer. "I am talking about time and prioritizing that time to think about the entrepreneurial aspects of the profession—value propositions, and the impact that good design can have on our cities." This increasingly forward-looking approach has led to a burgeoning focus on sustainability and climate change, as well as technology.

There has also been a notable trend toward community-focused design. Last year, for example, Pratt Institute introduced an M.S. in Urban Placemaking and Management, focused on creating successful

## Architecture-Student Survey

This year, 2,785 students responded to DesignIntelligence's survey about their satisfaction with architectural education. Of this group, 59 percent of the respondents were undergraduates. Of that percentile, 51 percent were enrolled in a B.Arch. program, 17 percent are seeking a B.A. in architecture, and 20 percent a B.S. The remaining 28 percent of respondents were enrolled in graduate programs, and, of those, 87 percent are pursuing an M.Arch.

62% Excellent

30% Above average

7% Average

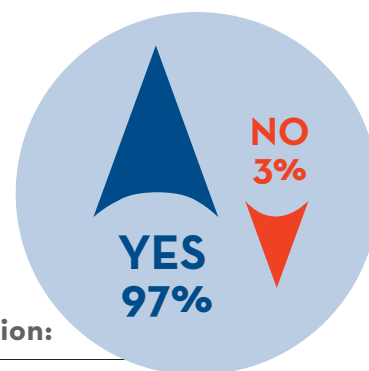
1% Below average

How they grade the quality of their program overall

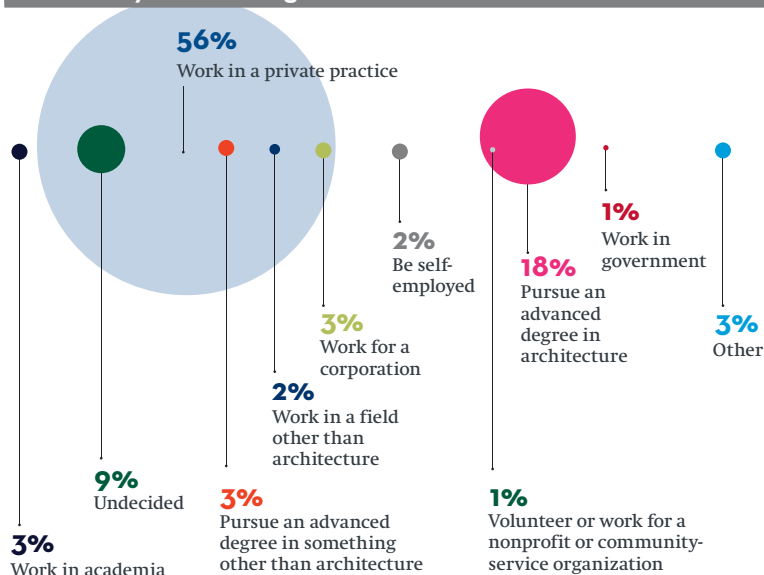
81%

plan to take the Architect Registration Examination

Believe they will be well prepared for their profession upon graduation:



### What they'll do after graduation



## Skills Assessment

The academic programs that practitioners deem strongest for each skill area:

### DESIGN

1	Harvard
2	Cornell
3	Columbia
4	SCI-Arc
5	Yale

### SUSTAINABILITY

1	Cal Poly, SLO
2	MIT
3 (TIE)	UC, Berkeley
	University of Oregon
5	Auburn

### CONSTRUCTION METHODS & MATERIALS

1	Cal Poly, SLO
2	Auburn
3	MIT
4	Virginia Tech
5	Cal Poly, Pomona

### COMPUTER APPLICATIONS

1	MIT
2	Columbia
3	SCI-Arc
4	Cal Poly, SLO
5	Harvard

These charts reflect combined accredited B.Arch. and M.Arch. programs.

## Programs Most Admired by Deans and Chairs

This year, Design Intelligence polled 215 deans and chairs for their rankings of architecture schools.

### UNDERGRADUATE

1	Cornell
2	SCI-Arc
3	Virginia Tech
4 (TIE)	Auburn
	Pratt Institute
	University of Virginia

### GRADUATE

1	Harvard
2 (TIE)	MIT
	University of Minnesota
4	SCI-Arc
5	Princeton

public spaces. Cramer says, “I am excited about the future of the profession because I think its going to be one of greater impact.”

### For Firms, Personality Trumps GPA

When firms interview employees, Cramer’s research shows, they regard GPA as one of the least important factors. Those hiring usually first look at personality, then portfolio, and then work experience when determining ideal candidates. “They are looking for young professionals with communication skills, curiosity to learn, and high energy,” says Cramer. But before architects with less-than-stellar grades breathe a sigh of relief, he says, “They are expecting the new hires to be able to do work that is billable right away.” This is why top-tier schools such as Harvard routinely score well on the top 10 list. “Firms think they get value from these new hires right away,” says Cramer. “They can adjust with agility.”

### And They’re Hiring!

Though architecture internships have earned a reputation for low salaries and long working hours, it is actually a great time for young professionals to enter the field, according to the research. Many large firms in growing cities such as Washington, D.C., are scrambling to fill vacancies. In fact, Cramer—who visits dozens of firms annually—says that among fledgling architects, there is virtually zero unemployment (the Department of Labor reports 3 percent unemployment for the profession in general). “Firms can’t find qualified people for these vacancies,” Cramer says. “There are people out there who haven’t kept up with some of the technologies—virtual reality and advanced BIM systems. They get laid off.”

Better still, salaries for beginning architects are climbing. The national average for a first-year intern is around \$42,000, but “we are talking to some firms that are this year raising starting salaries \$3,000 and \$8,000 and some as much as \$10,000,” says Cramer. Just avoid New York, he says, where intern salaries are notoriously low, and the job market is saturated.

But those in the field are also on guard for the next recession. “There is an alert attitude in the profession, and firm leaders are watching economic indicators so that there can be some foresight brought to practice and management,” says Cramer. “There is a great deal of emphasis on resiliency and agility for what’s around the corner,” he adds, making the need for innovative and adaptable architects more urgent than ever. ■

## Methodology

DesignIntelligence sent surveys to CEOs, managing partners, and human-resource directors asking about their findings in hiring architecture graduates. The respondents could select up to 10 National Architectural Accrediting Board–certified undergraduate and graduate programs in each category. Each survey response was checked for authenticity and validated by the research staff at DesignIntelligence. In cases of dubious or unreliable information that could not be confirmed, researchers eliminated the questionable return. Researchers also confirmed that the person responding to the survey was in a hiring capacity. In addition to the architectural component of DI’s research, the study includes rankings and satisfaction surveys for the professions of interior design and landscape architecture. This information is published annually in DesignIntelligence’s eponymous reports, along with a comprehensive list of the firms and employing organizations participating in the research.

*Longboard*<sup>®</sup>

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

We love architecture as much as you do.

CIRCLE 138



Architect: Henriquez Partners Architects  
Project: Immigration Services Society, Vancouver B.C. Canada  
Product: LONGBOARD<sup>®</sup> 6" V Groove in Dark Fir, Moonstone & Light Grey



# Interior Glass Door Solutions



**Transparency encourages trust  
and fosters understanding.**

Room Dividers  
Office Partitions  
Barn Doors

Privacy Walls  
Swing Doors  
Suspended Systems

**SPACE PLUS™**

A division of The Sliding Door Company®

**Call now (888) 433-1333**

CIRCLE 177

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



# suspenders™

Suspenders™ is a delicately scaled, modular system of interconnected elements and suspended LED luminaires. Dramatically powerful in its message of utility and simplicity, Suspenders can be configured as individual lighting sculptures or as a tiered web of infinite scope and variety. Explore the possibilities at [sonnemanawayoflight.com](http://sonnemanawayoflight.com).

[www.sonnemanawayoflight.com](http://www.sonnemanawayoflight.com)

Multiple U.S. and foreign patents pending

CIRCLE 143

**SONNEMAN®**  
A WAY OF LIGHT

# MULTIFAMILY HOUSING

- 160 Essay: Welcome to My House
- 162 Via 57 West, New York, BIG
- 170 Corner House, London, DSDHA
- 176 Blackbirds, Los Angeles, Bestor Architecture
- 182 Greenwich Housing, London, Bell Phillips
- 186 East Side Lofts, Frankfurt, 1100 Architect
- 192 Carmel Place, New York, nArchitects

PHOTOGRAPHY: © LUCA MISEROCCHI

36

CORNER HOUSE, LONDON, BY DSDHA



# Welcome to My House

From superblocks to revamped office and industrial spaces to new structures that combine supportive and market-rate housing, *home* takes on a whole new meaning in the 21st century.

BY JOHN KING

VISIT ANY prosperous city these days, particularly in the U.S., and here's what you'll see: an abundance of housing on the rise. Glass towers with zippered balconies in some neighborhoods, stucco-clad apartment blocks in others. Angled boxes that slide three or four units into neighborhoods where single-family houses were the norm, and boldly patterned slabs amid the parking lots and warehouses of faded industrial zones.

But no matter the city, no matter the design style of choice, I'll wager that you also hear concerns that this construction isn't enough. All these new structures with their roof decks and bike rooms and dog-washing stations are too rarely accompanied by ones that put roofs over the heads of the average worker. Or seniors on tight budgets. Or couples with no real recourse, if they lose their current home, than to end up on the streets.

This is the dilemma we face today. The need for housing is so profound—across all spectrums of society—but government hasn't caught up and financial resources are scarce. However, potential remedies do exist.

Nobody knows this better than architects—the ones with a social conscience, at any rate—who are exploring forms of living arrangements that might expand the options and pull down the costs. Micro-units are the current rage, compounds of efficiently minuscule, though not necessarily cheap, apartments geared to singles who don't mind eating out six nights a week. Some architects are exploring the idea of newly constructed “group housing,” with communal kitchens and ADA-compliant bathrooms for each batch of small “suites.” Cohousing is an older example—distinct housing units designed and

managed to allow families to share responsibilities and common space. Millennials today enjoy concierge service and group activities in co-living buildings. The ever-hopeful forays into modular or prefab housing are another—that confidence that someday, somebody will crack the nut and bring cheap construction methods to the masses.

Tiny houses, anyone?

All these ventures are laudable because, realistically, the best answer is: offer as many answers as possible. Unfortunately, American cities today would rather put up roadblocks than clear the way for innovation. That's certainly what I've observed in San Francisco, where residents of wealthy towers portray themselves as environmentalists while they file lawsuits to keep other towers from crowding their views. Meanwhile, so-called “progressive” activists in 2016 went to the ballot in an unsuccessful effort to block any new market-rate housing from being built in the heavily Latino Mission District. Their rationale was that if you stopped new development there would be no more gentrification (so much for the laws of supply and demand, or the fact that developers were attracted to the Mission because of the gentrification that already had occurred).

“Housing is the ultimate architectural problem of our time,” says Mark Macy, a San Francisco architect who won praise for cultural spaces designed with then-partner Mark Jensen before starting his own firm in 2008, focused on housing. “We need innovations—but innovation is considered risky, so banks hesitate, even if you can show there's a market.”

In 2013, Macy worked with developer Build Inc. to conceive a 21st-



From left to right: Frits van Dongen reintroduced the superblock for a housing development in Seoul's Gangnam District. With an initial conceptual design by OMA, FAA + XDGA 15 architects designed new buildings for living, working, retail, and education on the roof and in the interior of a former storage hall in Paris. Designed by PLP Architecture, the Collective Old Oak in West London is currently the world's largest co-living space. Morris Adjmi Architects created a 33-unit condo building by developing a mirror image of a historic red-brick and terra-cotta warehouse in New York. Designed for low-income families, 1180 Fourth Street in San Francisco features a courtyard for sports and film screenings.

century market-rate version of a large Victorian house after it had been split into smaller residences: within the six-story complex in San Francisco's South of Market district, there'd be 28 "group houses," with 470 beds divided among 235 "suites" of under 250 square feet. Each suite would have a tiny bedroom and cooking area, while each "house" included more enticing (and code-compliant) facilities.

Think of post-collegiate dorms, or micro-units taken to the next level. But by the time the complex was approved last fall, the numbers had frayed beneath the weight of city fees geared to conventional housing and higher lending fees. What will break ground in 2017 looks the same on the outside—but inside there will be 119 conventional units, mostly studios, holding 172 bedrooms in all.

Even if governments and neighbors are willing to let experimentation reign, there are the financial hurdles. The logic behind cohousing is compelling, but conventional mortgages defined by the notion of individual ownership don't fit a "product" that by its nature is communal. The issue isn't whether they provide good homes—more than 150 have been developed in the United States since the late 1980s; it's whether banks can be convinced to fund construction or underwrite mortgages of something that's not the norm.

Factors like these help to explain why so many new housing complexes seem interchangeable. There are a limited number of easily financed housing models, each one producing variations on the same monochromatic theme, marketed to niches that are more complex in real life than on a developer website. The generic approach shrugs off geography as well: a five-story chunk of infill market-rate housing, wood frame above concrete base, is likely to take the same form in Minneapolis or Albuquerque, Dallas or Denver, no matter the climate or terrain.

This isn't how things should be in our world, where the deceptively simple notion of "household" has atomized in recent decades. But then, such one-size-fits-all thinking has always come up short—or at least it has since 1944, when the Museum of Modern Art asked in the catalogue for its *Built in USA, 1932–1944* exhibition: "Isn't it socially and architecturally preferable to plan each neighborhood for the various needs of

many kinds of individuals and families, rather than for any one special income group and family type?"

The appropriate response is yes, of course. That's why it is exciting, despite all the bureaucratic and corporate obstacles, to see architects striving to produce innovative and urbanistically appropriate living options across the social, cultural, and economic spectrums.

This can mean the addition of new housing in historic districts, such as the richly rigorous Corner House by DSDHA in London (page TK), or the redevelopment of Denver's South Lincoln housing project as the Mariposa District, an ongoing effort that increases the number of apartments from 270 to 800, half of them subsidized for low-income residents. There's a different architectural firm for each block, to provide a varied landscape across the 18-acre site. As a whole, it blends the edges into the surrounding neighborhood of single-family houses.

Architecture also can turn heads. In South Korea, the long-discredited notion of superblocks is being reinterpreted sculpturally for public housing by Dutch architect Frits van Dongen; in New York, Bjarke Ingels's Via 57 West (page TK) strives to recast the residential skyscraper as a notched, silvery pyramid. In San Francisco, 1180 Fourth Street—the portal building to the redevelopment district where the Golden State Warriors will build their new arena—is a 150-unit complex of low-income family apartments designed by Mithun and Kennerly Architecture.

Again, there's no single solution. Nor can worthy architecture overcome decades of federal neglect and local inertia. In San Francisco, I can show you a dozen affordable-housing projects designed by local architects for local nonprofit developers that any city would be proud to have. I also can show you clusters of tents filled by homeless people.

But good architects can produce good models, attractive and tactile structures showing us that the future needn't be as frustrating as the recent past. With luck, those models will be noticed—and emulated—more and more in the years to come. ■

*John King is the San Francisco Chronicle's urban design critic and author of Cityscapes 2: Reading the Architecture of San Francisco.*



Via 57 West | New York | Bjarke Ingels Group

# Pyramid Scheme

A daring apartment building reshapes the New York skyline along the Hudson River.

BY JOSEPHINE MINUTILLO

PHOTOGRAPHY BY IWAN BAAN

Within New York's recent architectural renaissance, Via 57 West—appearing like a giant silver sailboat along the Hudson River on Manhattan's far West Side—is an anomaly. Sure, luxury residential towers by a slew of A-list architects are going up at a record pace in the city. And while most are nice enough, and indeed an improvement on the bland, white-brick piles of decades past, not many examples from the current crop are really pushing the envelope. Via 57, on the other hand, with its pyramidal shape and sweeping roof-cum-facade, is a radical departure from the apartment block typology.

So how did it get built? To hear Bjarke Ingels tell it, it happened by chance. But after several not-so-chance meetings beginning in 2007 with Douglas Durst, developer of the 709-unit, 831,000-square-foot Via 57, Ingels had his first major commission in the U.S. With it came the opportunity to open a New York office—now 200 strong—of his Copenhagen-based Bjarke Ingels Group (BIG), and to bring his BIG ideas, exemplified in projects like the sloping, bow-shaped, 475-unit 8 House in his native Denmark, to a still conservative New York real-estate market.

For the developer, that kind of dynamic architecture is perhaps just what was needed to draw potential tenants to a difficult location. Hemmed in by a Con Ed power station, a sanitation garage, and the noisy West Side Highway, the site is also a 15-minute walk to the closest subway station—an unappealing hike by Manhattan standards. “Residential was not our first thought for this lot,” says Jordan Barowitz, vice president and director of external affairs for the Durst Organization, which originally considered putting a data or health-care facility there.

How the building physically got built is surprisingly straightforward, given its complex geometry—which starts as a rectangle at the base and whose three walls

**SHIP SHAPE** The form of the building shifts depending on the viewer's vantage point. Seen from the southwest, it appears like a boat about to set sail on the Hudson River.



(rather than the four of an actual pyramid) come to a point 467 feet above the ground. In order for that to happen, the largest wall, facing southwest, takes on a hyperbolic paraboloid shape. That unitized facade is composed of 1,200 curved stainless-steel cladding components, each unique and fabricated off-site, that were abrasive-blasted for a textured finish. Ranging in size from 25 to 30 feet wide, they are clipped onto tracks that run up and down the simple post-and-beam concrete structure.

Building that twisting surface may have been easy enough, but designing it from inception to execution was a challenge. “That element infused so much coordination among so many consultants, from cleaning and building-maintenance concerns to water management,” says BIG partner and project leader Beat Schenk. “But it is the heart of the building.”

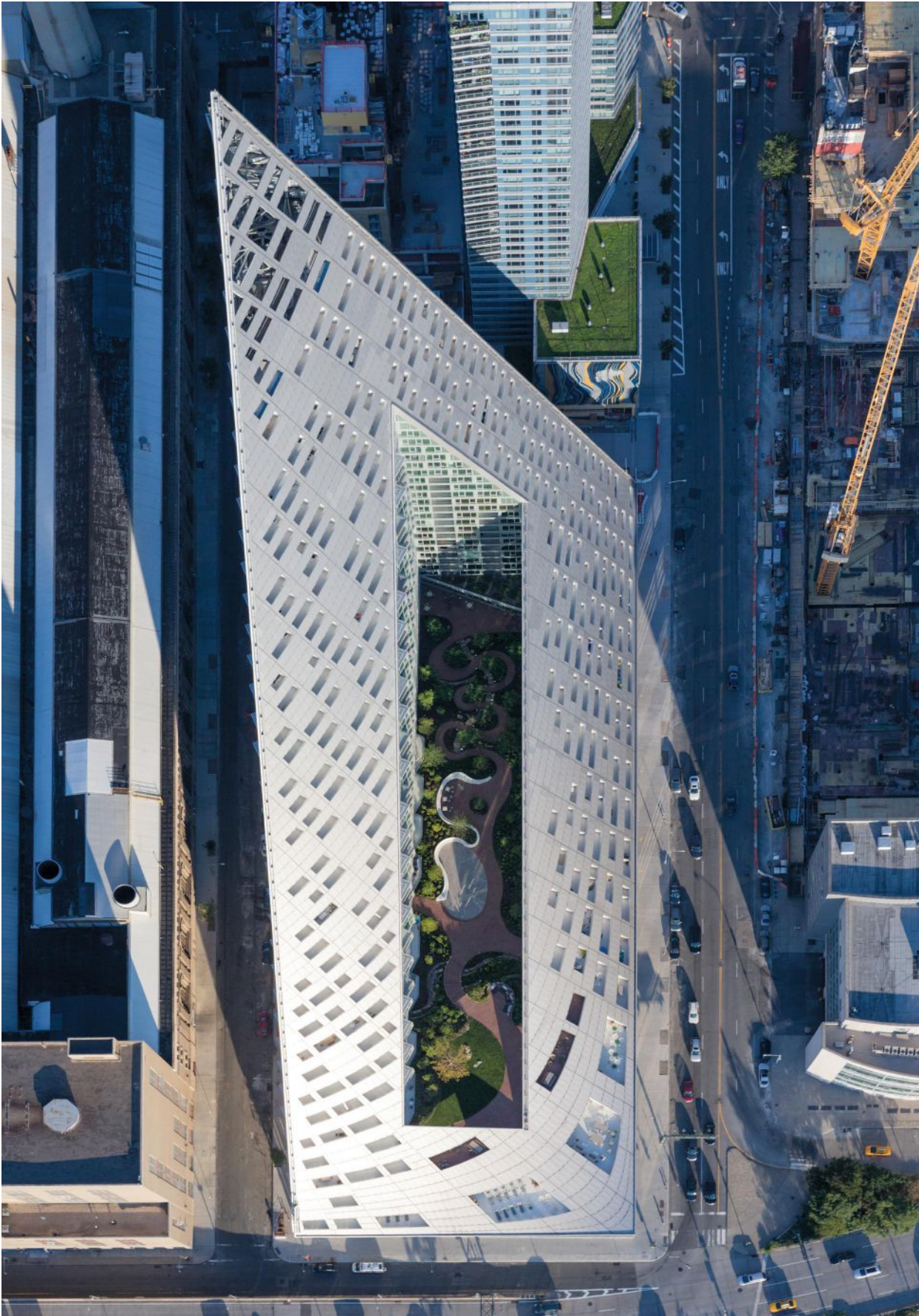
**HOLDING COURT** Working with landscape architects Starr Whitehouse, BIG designed the verdant courtyard to be an oasis in a gritty part of Manhattan (opposite). A third of the apartments overlook the courtyard, each with private balconies or terraces either built into the curtain wall or protruding from it (above).

Scooped out of its midsection is a generously proportioned and beautifully landscaped courtyard—what Ingels calls an “oasis” in the midst of less than idyllic neighbors. And it is just that. With sunset views of the Hudson, the courtyard offers communal grills for outdoor barbecues or purpose-built tables for a game of chess.

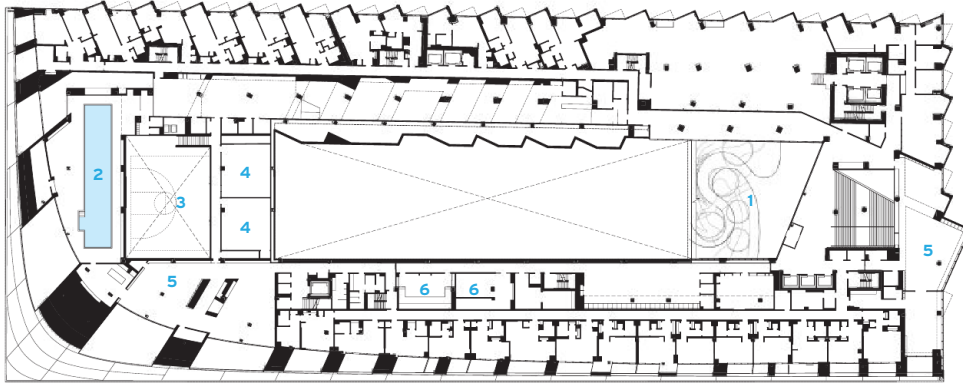
The list of amenities gets longer inside the building: a community room, pool, basketball court, gym, and a game room complete with skee ball, air hockey, and poker tables, to name a few. That comes at an additional \$80-a-month fee on top of what are pricey rents—starting at \$3,700 for a studio—even for New York. Of the 709 units, just





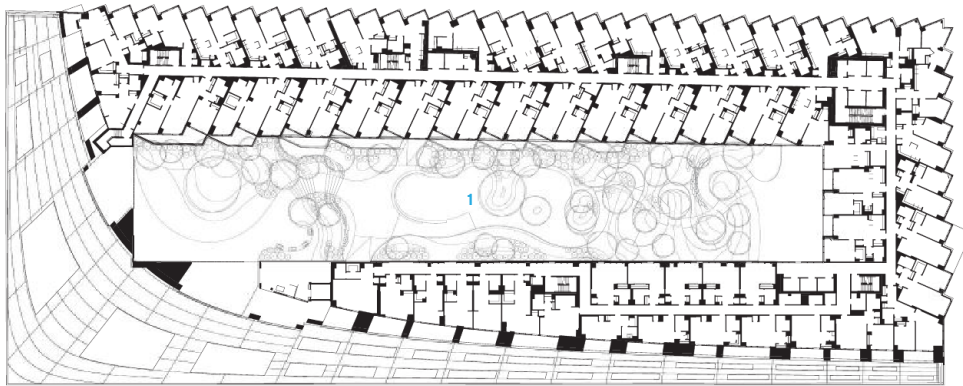


**MAKE A POINT**  
The building's apex, at the northeast corner, reaches 467 feet above the ground. The 31st floor is the last containing apartments. Above that, where the perforations in the facade get larger, are mechanical units (left). The twisting geometry is a hybrid between a tower and a courtyard building (opposite, bottom).



SECOND-FLOOR PLAN

0 50 FT.  
15 M.



FOURTH-FLOOR PLAN

0 50 FT.  
15 M.

- |                    |                  |
|--------------------|------------------|
| 1 COURTYARD        | 4 FITNESS STUDIO |
| 2 SWIMMING POOL    | 5 COMMUNITY ROOM |
| 3 BASKETBALL COURT | 6 GAME ROOM      |

credits

**ARCHITECT:** Bjarke Ingels Group – Bjarke Ingels, Thomas Christoffersen, partners in charge; Beat Schenk, project leader

**ARCHITECT OF RECORD:** SLCE Architects – Luigi Russo, managing principal

**ENGINEERS:** Thornton Tomasetti (structural); Dagher Engineering (m/e/p); AKRF (environmental); Langan Engineering (civil); Philip Habib & Associates (transportation)

**CONSULTANTS:** Starr Whitehouse (landscape); Vidaris (building envelope); Enclos (facade); Cerami & Associates (acoustics); Nice Kern (wayfinding); Van Deusen & Associates (vertical transportation); Brandston Partnership (lighting); CPP (wind engineering and air quality)

**GENERAL CONTRACTOR:** Hunter Roberts Construction Group

**CLIENT:** The Durst Organization

**SIZE:** 831,000 square feet

**COST:** withheld

**COMPLETION DATE:** August 2016

SOURCES

**METAL FACADE PANELS:** Contrarian Metal Resources

**GLASS:** PPG

**ROLLING DOORS:** Cookson

**WOOD CEILINGS:** 9Wood

**CUSTOM WOODWORK:** PGS Millwork

**SURFACES:** Caesarstone, Wilsonart

**PLUMBING:** Grohe, TOTO, Moen, Kohler, Elkay

**EXTERIOR LIGHTING:** Selux, BEGA, Jesco, Inter-Lux

**INTERIOR AMBIENT LIGHTING:** KiBiSi, Lumenpulse, Bartco, Bec Brittain, Selux, Flos, Zaneen, Delta Light, Lucifer Lighting Company, Louis Poulsen, Bega, ALW, Vode, Acolyte, iGuzzini

**WALLCOVERINGS:** Wolf Gordon (corridors); Guardian (elevator cabs)

**ELEVATORS:** Fujitec

**BAMBOO PANELING:** Plyboo

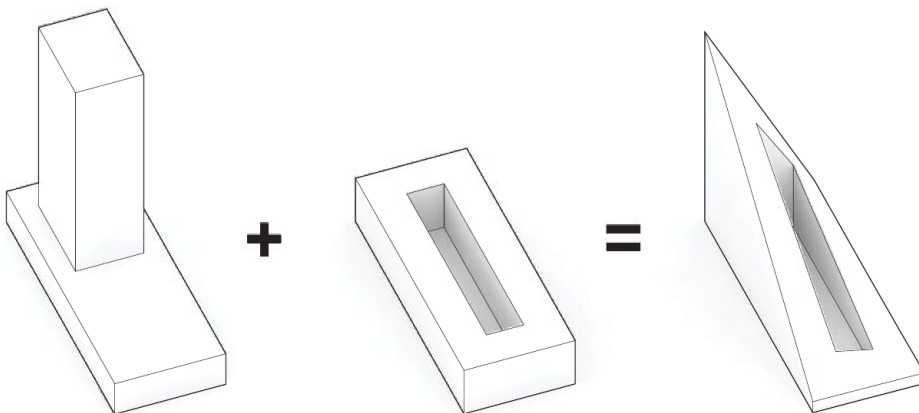
**FELT PANELS AND CURTAINS:** Kvadrat

**PAINT:** Benjamin Moore

**TILE:** Daltile (pool, bathrooms); Allstate (fitness area)

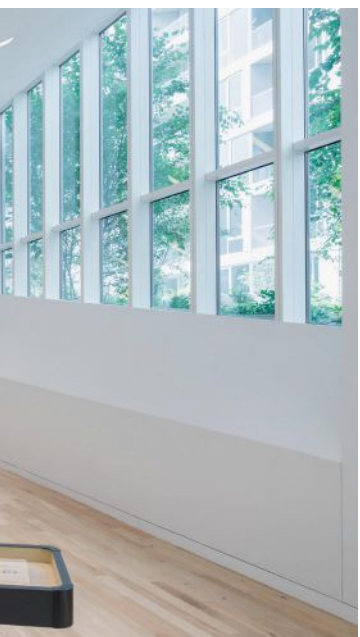
**RESILIENT FLOORING:** Globus Cork

**CARPET:** Interface



CONCEPT DIAGRAM





over 200 had been spoken for by the start of last month after going on the market in May. According to Barowitz, “That’s an average absorption rate for rentals in Manhattan.” Some floors are still under construction, though tenants began moving in earlier this summer. The pace may pick up when retail tenants, including the American Kennel Club and Landmark Theatres—bringing up to eight movie screens to the building—move in next year.

A third of the units overlook the courtyard, each of them with a private terrace or balcony. Ingels, in fact, calls the building a “courtscraper”—combining features of a classic European courtyard building and a skyscraper. That manipulation of scale, however, has both advantages and drawbacks. The upper-level units—the highest occupiable floor is the 31st (above that, where the building reaches its summit, is mechanical space)—feel expansive and have stunning

views. Deeper inside, however, translating that compact European building type to a long New York City block has resulted in endless corridors. Some studio units at the end of the hallway on the south side, where the building curves in, fall victim to the compressed floor plan there. The rest of the layouts, which BIG did not design, are fairly standard—it’s not spacious luxury for which tenants are paying a premium.

If you’re a kid with a lot of start-up or hedge fund money, who takes an Uber to work in the morning and enjoys a round of virtual golf when you get back at night, this may be the perfect place to call home. But even the highest-concept architecture can’t overcome deficiencies of location or aspects of the development that are out of the architect’s control. Still, it was a rare achievement that Via 57 got built, and Ingels has succeeded in creating an instant icon on the New York skyline. ■

#### CITY SLICKER

The lobby brings elements of the sidewalk, including the concrete floor and brick walls, into the building (opposite, top). Each apartment has a bay window or private outdoor space (opposite, bottom, left). Amenities include a billiards room (opposite, bottom, right). Units opening onto the courtyard have an expansive feel and striking views (above).

Corner House | London | DSDHA

# House of Commons

A fresh design elegantly combines commercial space with market-rate and affordable housing.

BY MEGUMI YAMASHITA



In the streets of Fitzrovia, in central London, the locally based architecture firm DSDHA has created an intriguing introduction to this urban neighborhood. As its name suggests, the Corner House sits smartly at the junction of the foodie haven Charlotte Street and tranquil Tottenham Street, a stone's throw from bustling Oxford Circus. Among a hodgepodge of 18th-century houses with narrow frontages, postwar industrial buildings, and glossy contemporary offices, the Corner House succeeds in discovering freshness solidly rooted in timelessness.

DSDHA had previously collaborated with the client, Derwent London, on its growing portfolio of property in the Fitzrovia area. The architects' past projects, from schools to residential buildings, have demonstrated their flair for functionality. Corner House, an apartment building, goes more deeply into the crafting of each interior space, resulting in a discreet architecture of quality and elegance.

In the face of skyrocketing rents in the capital and a deficiency of new social housing, local planning authorities offer incentives to developers to build affordable housing, requiring a certain number of such units in large developments. Camden Council, the authority overseeing the site of Corner House, was par-

ticularly eager to encourage the building of these units, which are sold or rented with government subsidies. DSDHA's six-story building incorporates two of these affordable-housing units as well as nine market-rate apartments, including a luxurious penthouse, and commercial space on the ground floor.

Corner House is a building with three subtly different facades—the main ones on Charlotte and Tottenham Streets, and a third on the tiny Tottenham Mews—each presentation of the building a variation on a refined material language. The tone of brick and proportional massing changes to reestablish the three historical addresses on the site and create three separate entrances to the building: a commercial entrance and separate entries for the market-rate and affordable housing. This allows the building to escape the feel of a large combined city block while trying to avoid the politically charged “poor door” by presenting the respective doors on different elevations of the building.

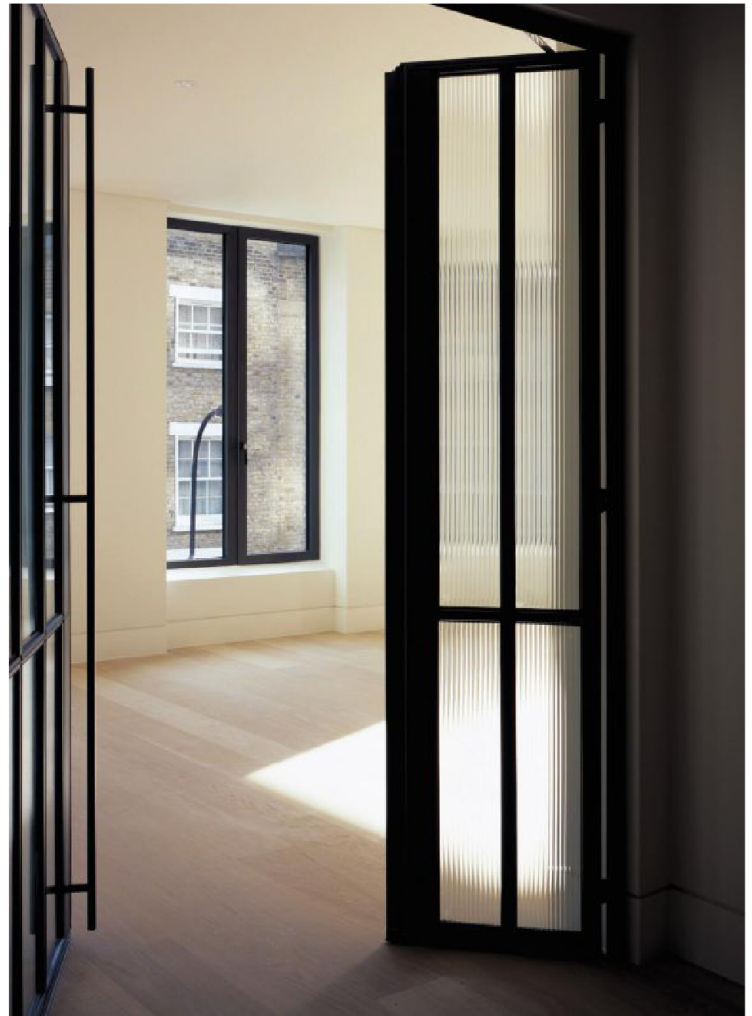
What is striking at street level is the architects' attention to detail and craft. Tom Greenall, associate director at DSDHA, describes how Derwent London was keen to use brick to give the building a “resolutely residential” character, in contrast with glazed, more corpo-



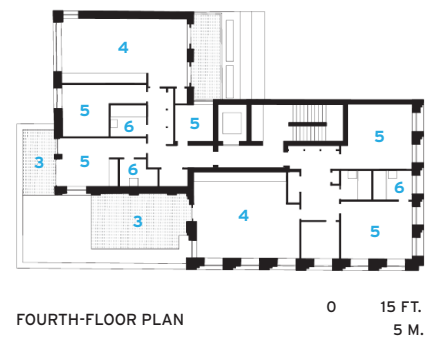
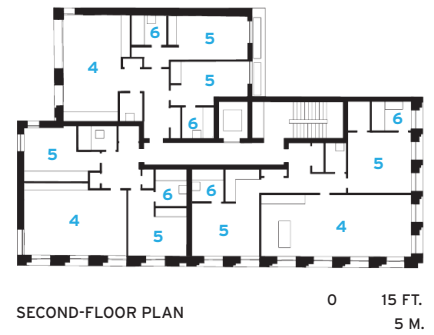
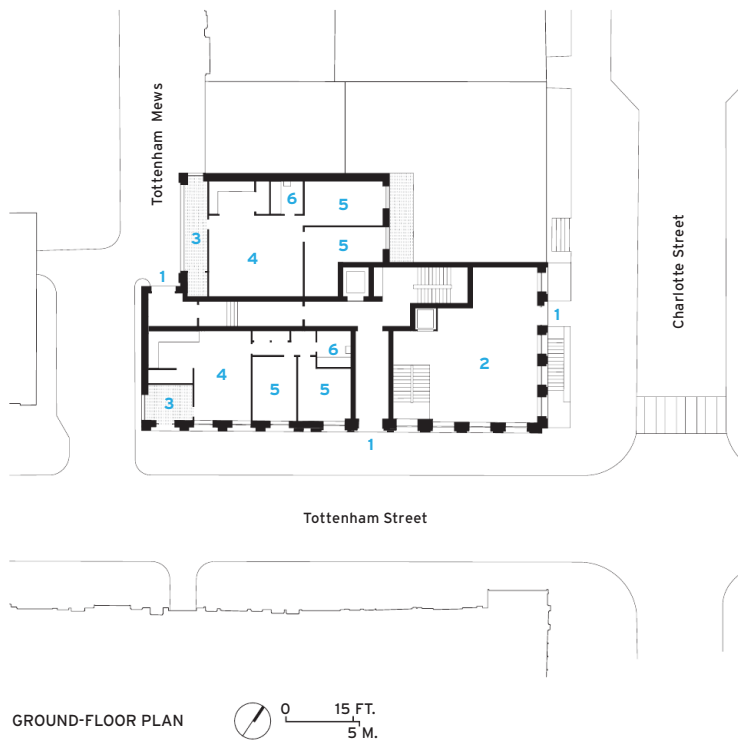
PHOTOGRAPHY: © CHRISTOPHER RUDQUIST, EXCEPT AS NOTED; LUCA MISEROCCHI (RIGHT)



GOOD NEIGHBOR The gray brick nods to the surrounding architecture while offering a modern take (left). Three distinct components help break down the building's massing (above).



- 1 ENTRANCE
- 2 COMMERCIAL
- 3 TERRACE/GARDEN
- 4 KITCHEN/LIVING/  
DINING
- 5 BEDROOM
- 6 BATH
- 7 LIVING

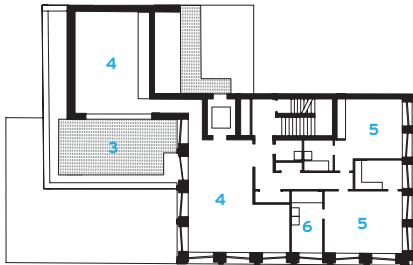




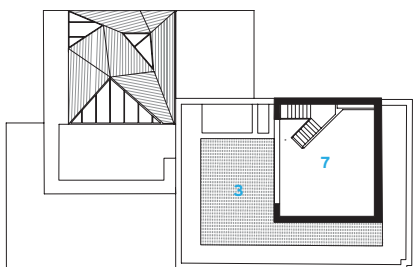


rate developments. After deep analysis of Fitzrovia's modern and historical facades, a dark charcoal and light gray brick were chosen. The practice collaborated with Petersen, a Danish brick company well known for its handmade and "water-struck" bricks, which give each masonry unit an individual character and irregularity. DSDHA used these bricks to create a load-bearing structure with traditional lime mortar, in harmony with its historical context. Although this required intense craftsmanship and longer construction times, it minimizes the building's concrete frame and foundations, as well as reducing the need for complex movement joints.

The translation of formal 18th-century facades into this contemporary counterpart is handled with grace and originality. The brickwork is stepped to form asymmetric reveals,



FIFTH-FLOOR PENTHOUSE PLAN



SIXTH-FLOOR PENTHOUSE PLAN



**INSIDE AND OUT** Dark metal punctuates the facades (opposite, left) and carries into the interiors (opposite, right and this page, left), culminating in an elegant stair, just beyond the main residential entrance (above).

### credits

**ARCHITECT:** DSDHA – Deborah Saunt, Tom Greenall, Matthew Lambert, Arnold Seligmann, Deb Adams, Natasha Reid, Luke Jackson, Jeremy Corminboeuf, Marine Fleury, Marianna Filippou

**ENGINEERS:** Elliott Wood (structural); GDM Partnership (services)

**CONSULTANTS:** Core Five (quality surveyor); Gardiner & Theobald (project management); BWC Fire (fire)

**GENERAL CONTRACTOR:** Knight Harwood

**CLIENT:** Derwent London

**SIZE:** 19,400 square feet

**COST:** withheld

**COMPLETION DATE:** October 2015

### SOURCES

**MASONRY:** Petersen

**METAL PANELS:** Rheinzink

**TIMBER FLOORING:** Dinesen

**WINDOWS:** Schüco



with a subtle hierarchy of sizes between each row of openings. The top-floor windows are angled inward to create a shifted and distorted reflection from the exterior, adding to the details that make this facade striking while exercising restraint.

DSDHA's attention to openings and admission of light is central to making the interiors welcoming. The internal planning provides every apartment with windows on two or more elevations, and the building nimbly negotiates the requirements of surrounding buildings' right to light under London's building code.

The crowning jewels of the Corner House are two faceted pavilions for the top-floor penthouse, which nestle into the city's roofscape. Using the envelope established by right to light, the pavilions open up seductive spaces in a modern "attic." These more contemporary features are also intensely hand-crafted. Custom-made scored zinc cassettes are fitted together to form each facet, allowing rainwater to drain behind the roof surface and obviating the need for any visible gutters.

The architects also designed metal railings and decorative grilles, giving the exterior a subtle opulence, with echoes of its historical con-

text. This language of dark metal continues into the interiors and common spaces of the building. The triumphant feature is the metal staircase, carefully positioned to be directly in view as soon as you enter the main residential door. The staircase was made in small sections and welded on-site, to achieve an illusion that the stairs have been folded from a continuous sheet of metal. A process of hand-bending and hand-rolling the metal was used to create a balustrade with swan-neck junctions. It is at these points that the practice has shown its willingness to invest in details to create a richer whole.

The Corner House sets a high bar for a contemporary intervention into a complex historical site. Affordable units are typically rather standardized; DSDHA's intelligent and innovative integration of lower-cost units into this building leads the way for higher-quality, bespoke subsidized housing in central London. DSDHA has created a persuasive balance of affordable and luxury, past and present, solidity and elegance, to create a quietly alluring building. ■

*Megumi Yamashita, originally from Japan, is based in London and writes about architecture and design.*

**CROWNING GLORY**  
Two zinc-clad faceted pavilions top the penthouse apartment (right), which spills out onto generous terraces. Its attic-like interior is amply daylit (opposite), thanks to a design that has windows on at least two exposures in all units.





**PUBLIC FACE**  
Cladding in fiber-cement and standing-seam metal unite and distinguish the 18 residences in this hilltop development.

Blackbirds | Los Angeles | Bestor Architecture

# Top Flight

A complex explores siting and massing to downplay density and elevate quality of life.

BY DEBORAH SNOONIAN GLENN

In housing-strapped Los Angeles, city officials are counting on multi-family developments, as well as small-lot single-family homes, to boost capacity and stabilize soaring prices. But most developers squeeze as many units as possible onto sites to maximize profits, giving no thought to aesthetics, common areas, or context. The resulting eyesores have ranged from forgettable to out of place to outright offensive, and often they exacerbate local traffic and parking problems. Not surprisingly, they've soured many Angelenos on the very idea of higher-density housing.

Blackbirds is a refreshing departure from the norm. Local architect Barbara Bestor designed this crisp and cheerful cluster of small-lot houses—which can be built with minimal setbacks, on lot sizes as small as 600 square feet—in Echo Park, one of L.A.'s oldest neighbor-





- 1 TRAIL UNITS
- 2 PERCH UNITS
- 3 BREWER UNITS
- 4 NEST UNITS
- 5 "PARKING PARK"

credits

**ARCHITECT:** Bestor Architecture – Barbara Bestor, principal; Stacey Thomas, project architect; Danielle Yip, Henry Cheung, Bianca Gavrilu, team

**CONSULTANTS:** Nishkian Chamberlain (structural); Shamim Engineering (m/e/p); Rothman Engineering (civil); Mia Lehrer+Associates (landscape)

**GENERAL CONTRACTOR:** Pacific Empire Builders

**CLIENT:** LocalConstruct

**SIZE:** 36,600 square feet (total lot); 1,360-1,930 square feet (range in size of houses)

**COST:** withheld

**COMPLETION DATE:** August 2015

SOURCES

**CLADDING:** Titan Sheet Metal with Carlisle, JamesHardie

**ROOFING:** Titan Sheet Metal with Carlisle, Owens Corning

**WINDOWS AND DOORS:** Arcadia

**GLAZING:** C.R. Laurence (glass railing), Solar Industries (skylights)

**PAINTS AND STAINS:** Benjamin Moore, Minwax

**SOLID SURFACING:** Corian

**TILE:** American Universal; Daltile

**PLUMBING:** Kohler, Hastings Tile & Bath, Hansgrohe, ROHL



PHOTOGRAPHY: © IWAN BAAH (THIS PAGE AND OPPOSITE, BOTTOM); LAURE JOLIET (OPPOSITE, TOP)

hoods, using a strategy she calls “stealth density.” Her meticulous attention to siting and massing makes the 18-home development appear much less dense than it actually is, while also carving out shared and private outdoor spaces and minimizing street impacts—all this on a signature hilltop location with panoramic views of downtown L.A. and distant mountain peaks.

It could easily have turned out otherwise. A half-dozen crumbling rental homes once stood on the 0.82-acre site, all owned by the same landlord, who’d planned to raze them to make way for an unremarkable 25-unit condo building. Instead, L.A. developer LocalConstruct bought the property, envisioning a collection of market-rate residences of modest size that would form its own community and also mesh with the surrounding single- and multifamily homes on Echo Park’s famously steep, narrow streets. This neighborhood-within-a-neighborhood approach has become the developer’s calling card in this city and beyond. “LocalConstruct saw Blackbirds as a legacy project, so design quality was important to them,” says Bestor, a former Echo Park resident known for her custom houses and commercial spaces. After interviewing a handful of local candidates, the developer tapped her in 2011 to design the residences, inside and out.

The project was Bestor’s first commission from a developer and her first multiunit housing community. Right away she saw that the spectacular site would put her skills to the test: the hilltop slopes away from its apex in many directions, and at different angles and rates. She exploited every square foot of this difficult topography to its advantage, pushing the two- and three-story townhouse-like homes to the perimeter of the lot to make way for a central landscaped plaza. “The site

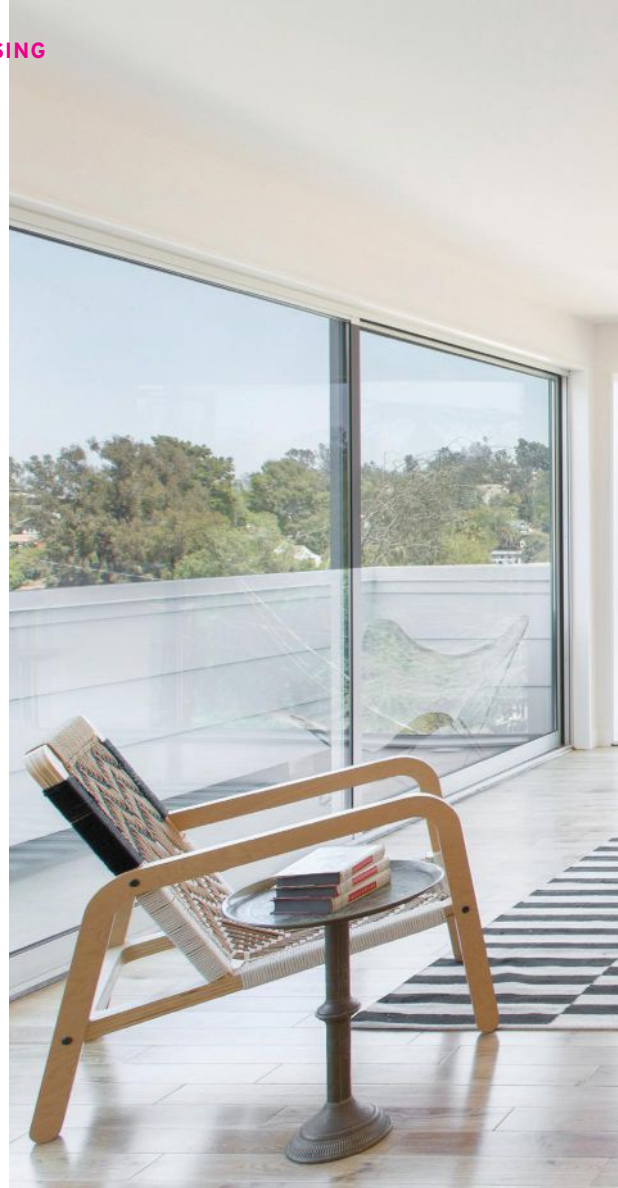


#### MIX IT UP

Blackbirds is tucked into an eclectic neighborhood of single- and multifamily houses (opposite). Balconies add living space to the compact interiors (above). Residents gather informally in the courtyard, which doubles as a parking area.

## DETAIL ORIENTED

Built-ins add storage where needed, and skylights above the staircases bring daylight deep into the interior (right). Kitchens are open to the main living area to create a seamless, casual flow (opposite, top). Bestor added glazing wherever possible to take advantage of expansive views (opposite, two).



plan became the organizing principle for the project,” she explains, as each unit’s public spaces were oriented to open onto this communal area, while bedrooms and private spaces snag city or mountain views, depending on their orientation.

The plaza also doubles as a parking court, since only six of the 18 houses have two-car garages. “L.A. codes require two parking spots per single-family house, but leaving some parking uncovered got us a lot more space for common use here,” Bestor notes. Landscape architect Mia Lehrer softened the hardscaping with native and drought-tolerant plantings, and varied the concrete pavement’s surface finish to visually distinguish the central courtyard, parking spaces, and walkways, a subtle space-defining technique that registers on an almost subliminal level. A parking area may seem like an unlikely place for residents to socialize, but it’s usually only about half full, leaving plenty of room for informal barbecues. One-car households are common at Blackbirds, thanks to greater reliance on biking, public transit (there’s a bus stop nearby), and ride-sharing services such as Uber.

And none of the two-car garages open directly into the houses but require a quick walk outdoors to each main entry, a move made palatable by L.A.’s forgiving climate. “Since the idea behind Blackbirds was to build community, we didn’t want neighbors to just disappear inside,” says Bestor.

The differentiated forms, massing, and cladding of the dwellings help them look cohesive but not cookie-cutter. Three houses stand alone at streetside, next to the plaza entry, while the rest are grouped

to look like what could be two-family houses until you get up close to them. (The units are actually separated by 6-inch gaps, which are obscured by flashing that matches the white metal or black fiber-cement siding.) The white triplex unit along the site’s northern edge, which is higher in elevation than the southern one, is topped by a simpler shed roof. “We designed it as a ‘Phase 2’ project in case it couldn’t get built this time around,” Bestor notes. It was she who coined the development’s name early in the project, noting that the angles of the black peaked roofs recall birds in flight.

All this finessing took much more effort than the average plug-and-play housing development. “I wish more of the floor plans could have been standardized,” Bestor remarks dryly. But the complicated topography made repetition nearly impossible; in many cases, floor plates for adjacent units don’t even sit at the same grade. She also made tweaks for the middle triplex units, since they have less glazing and fewer windows.

The interiors are hardly gargantuan, ranging in size from 1,360 to 1,930 square feet for two or three bedrooms. But soaring ceilings, ample skylights, and glass-backed built-in bookcases that form one wall of the staircases make them feel much larger. A sense of simple luxury also emerges from the stripped-down material palette of concrete, tile, wood, and glass, and from a handful of upscale touches like Carrara marble countertops and lighting fixtures by Brendan Ravenhill. All houses have at least one type of outdoor space, such as a small front patio or a cantilevered roof deck.





Blackbirds sold briskly after its 2015 opening, with sales prices ranging from \$795,000 to \$1.05 million—much higher than anticipated at the outset. But that’s the market in Echo Park these days; its vibrant restaurant and retail scene and its proximity to a booming downtown have made it one of L.A.’s most coveted places to live. And not-in-my-backyard fears expressed by a handful of neighbors that the project would clog their streets have not materialized. “We could have built more homes on the site, but doing so would have caused too much traffic,” Bestor says. No single development in L.A. can fix its housing shortage or sky-high home prices, but Blackbirds proves that higher-density housing can be distinctive, contextual, low-impact, and profitable. “Buyers here paid a premium for well-thought-out spaces,” says Bestor. “Investing in design, as LocalConstruct did, is a worthwhile effort.” With any luck, future projects in L.A. will follow its lead. ■

*Deborah Snooman Glenn, a former senior editor of RECORD and of This Old House, lives in Los Angeles, where she writes about architecture.*





Greenwich Housing | London | Bell Phillips Architects

# Elder Care

A simple but bold design brings distinction to affordable senior housing.

BY CHRIS FOGES

PHOTOGRAPHY BY EDMUND SUMNER

**B**ell Phillips Architects' Greenwich Housing in South London provides 22 single-story homes for elderly and disabled people, and it is a hit with residents. They talk enthusiastically about the qualities of light and space, as well as things others might take for granted, such as their ability to get into a shower easily. But the public housing project's greater significance comes from its wider context. While London is in the grip of a housing crisis, with soaring prices, rising demand, and supply constrained by development rules that limit outward and upward expansion, Greenwich Housing shows that architectural ingenuity can uncover latent opportunity for densification, at a reasonable cost.

The houses are arranged in short rows and split across six small publicly owned, underused parking lots. The topography of the sites varies—some are on hilly ground, others on flat—but all are irregularly shaped and hemmed in by neighbors ranging from modernist apartment blocks to petite Victorian row houses. Bell Phillips developed a standard house type that could be applied to each of these conditions, and to other sites later, with no alteration other than the color of the brickwork.

Single-story houses were demanded both by the program and by neighbors' rights to light, but the architect was anxious to make a clear distinction between these urban dwellings and the folksy retirement bungalows that blight suburbia. "Bungalow" is a loaded term," says director Hari Phillips. "We wanted to make these houses cool rather than twee, and give them some prominence in the streetscape so they don't seem shy about themselves."

This has been achieved by the use of heavyweight brick facades and the manipulation of the butterfly roof form of each house, which comprises four mono-pitched sections of varying height, all falling to a central valley and clad in a taut skin of reddish-brown standing-seam zinc.

The front facade is a continuous band of masonry, with recessed porches marking individual entrances. It establishes a strong horizontal datum and gives each group of houses a collective presence greater than the sum of its parts. Above each entrance, the steepest mono-pitched roof section pops up to form a crisply folded zinc cowl, framing a deep-set window and adding height and variety to the roofline. Another roof section rises above the brickwork at the back,



where each house has a small private garden. As all six sites are overlooked by surrounding buildings or from higher ground, the choppy sea of metallic peaks and troughs makes an intriguing fifth elevation.

In planning the 968-square-foot, two-bedroom houses, the architects were required to follow extensive guidelines covering the width and position of doors, wheelchair turning circles, and other accessibility concerns. They were also mindful that residents may spend extended periods at home and would benefit from a variety of spatial conditions, daylight levels, and views. Their first instinct was to emulate the efficiency of a single-story house built by Richard Rogers for his parents in 1969 (now a London outpost of Harvard's GSD). There, bedrooms are entered directly off an open-plan living area, fully glazed at both ends. But contemporary fire regulations required that Bell Phillips insert a corridor between the kitchen and bedrooms; this potentially dead space is used to accommodate deep storage closets that are useful to downsizing residents.

The main bedroom overlooks the garden, while the second faces the front and might be used by guests or overnight caregivers, or as a hobby room. The open-plan living area comprises three distinct spaces. At the front, a dining room is brightly lit by the lantern window above the door, and the ceiling follows the sloping roofline to give an internal height rising to 11 feet. It adjoins a central galley kitchen, with a more intimate, low-ceilinged seating area beyond.

**CURB APPEAL** The simple brick structure is topped by large, cowl-like windows clad in zinc that bring daylight deep into the rectangular units (above). The 22 units of 968 square feet apiece are spread out across six sites (below).





**ROOFSCAPE** A couple stands within the recessed entry of their unit (left). The one-story housing is located within the context of tall apartment buildings and small Victorian houses (above). The distinctive butterfly roof offers an intriguing fifth elevation (opposite). A galley kitchen is sandwiched between the living and dining areas (below, left).



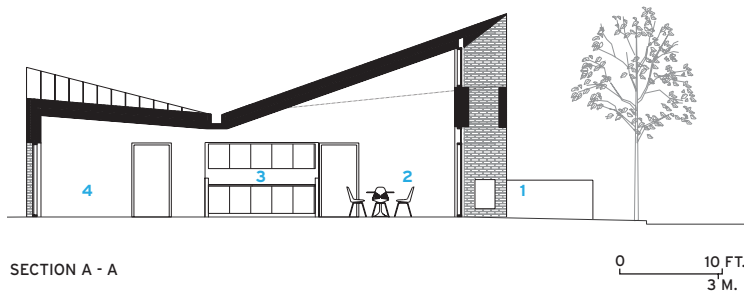
SITE PLAN

0 16 FT.  
5 M.



Each space reflects detailed consideration of the needs of older people. The architects decided against including an entrance lobby, which would retain heat when the door is opened but might hinder residents with reduced mobility. Likewise, a tall window next to the door provides a generous view of the street, which might counter feelings of isolation. If residents prefer to close the draperies for privacy, good daylight is maintained by the high-level window.

The benefits of Bell Phillips's careful work will be felt not just by residents, who now enjoy suitable accommodation, but also by the young families who move into the larger spaces they vacate, making better use of existing housing stock. And for those who fear that London's housing crisis is insoluble, the project offers reassurance that conditions of scarcity create fertile ground for architectural creativity. ■



SECTION A - A

0 10 FT.  
3 M.

- |               |                 |
|---------------|-----------------|
| 1 ENTRY PORCH | 5 GARDEN        |
| 2 DINING      | 6 MAIN BEDROOM  |
| 3 KITCHEN     | 7 BATH          |
| 4 LIVING      | 8 GUEST BEDROOM |

#### credits

**ARCHITECT:** Bell Phillips Architects – Tim Bell, director in charge; John Lineen, project architect

**ENGINEER:** Richard Jackson (structural)

**GENERAL CONTRACTOR:** Newlyn's

**CLIENT:** Royal Borough of Greenwich

**SIZE:** 21,000 square feet

**COST:** \$5.6 million

**COMPLETION DATE:** September 2015

#### SOURCES

**BRICK:** BEA Building Products

**WINDOWS AND DOORS:** John Watson Doors

**ROOF:** VM Zinc

East Side Lofts | Frankfurt | 1100 Architect

# Soul Sister

A new structure completes an unfinished century-old building by replicating its scale and adding some funk.

BY MARY PEPCHINSKI

PHOTOGRAPHY BY NIKOLAS KOENIG



ousing is in demand in Frankfurt-am-Main, yet loft living, or adapting obsolete manufacturing structures for open-plan residential use, remains a novelty, due in part to a dearth of century-old industrial buildings near the downtown area. But in 2009, when 1100 Architect was asked to convert the Lencoryt Building—formerly offices and a textile factory and now a historic monument—into dwellings, the designers felt a change was in order. “Some said lofts would not work, because this city is conservative,” says Gunter Weyrich, principal of the New York-based firm, which has a branch in Frankfurt, “but people are more open than many anti-



**NEW TWIST** Originally designed to be double its size, the Lencoryt Building, now combined with a bold addition fronting the harbor and known as the East Side Lofts, offers unique living spaces in downtown Frankfurt.



**THEN AND NOW** The new facade replicates the Lencoryt Building's scale without imitating its landmark design (above). Units open to a courtyard (left). Interiors in Lencoryt reveal traces of the past, like the exposed wood roof truss (opposite, top). Units in the new building feature floor-to-ceiling windows (opposite, bottom).

pated. And they think the site is thrilling.”

The east harbor district, where the project is located, has attracted artists and creative businesses. It includes a jumble of commercial and port-related enterprises sprawling north from Coop Himmelb(l)au's new European Central Bank tower. Completed in 1913, the Lencoryt Building, with 60-foot-deep interiors and generous fenestration, is a rare surviving example of the city's industrial architecture prior to World War II. Designed to be double its built size, it would have occupied the southwest corner of a block, with a long facade fronting the harbor. World War I intervened, and only the first phase, an L-shaped building facing a side street with a wing extending into a courtyard, was realized. Despite continuous use, its exterior was dilapidated and its once splendid lobby



## credits

**ARCHITECT:** 1100 Architect – Juergen Riehm, partner in charge; David Piscuskas, partner; Susanne Milne, Gunter Weyrich, project managers

**ENGINEERS:** Ingenieurbüro P. & K. Toni (structural); Prof. Quick und Kollegen (civil); Ingenieurbüro Tegl (m/e); HEBO (acoustical)

**GENERAL CONTRACTOR:**

BOP Gesellschaft für Bauoptimierung

**SIZE:** 160,000 square feet

**TOTAL COST:** \$45 million

**CONSTRUCTION COST:** \$38 million

**COMPLETION DATE:** March 2015

**SOURCES**

**WOOD WINDOWS AND DOORS:** Poetschke Tischlerei

**METAL WINDOWS AND DOORS:** Schüco

**SKYLIGHTS:** Warema

**LOCKSETS:** FSB

**ACOUSTICAL CEILINGS:** Sto

**TILE:** Mosa

**INTERIOR AMBIENT LIGHTING:** Foscarini

**EXTERIOR LIGHTING:** Bega

**ELEVATORS:** ThyssenKrupp

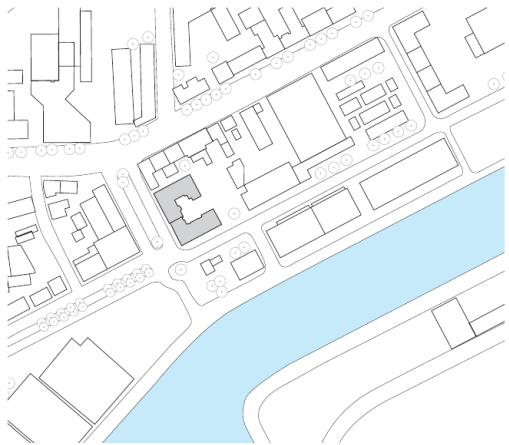
**CUSTOM WOODWORK:** Heruday Schreinerei

had been altered beyond recognition.

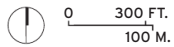
To convert it to residential use, a variance was obtained, and a second building, conforming to the planned 1913 footprint, was added. Together, the Lencoryt Building and the new one became the East Side Lofts. Although both have two vertical circulation cores servicing a below-grade garage, the Lencoryt features ground-floor offices, with studios and one-bedrooms on floors one to five, while the new section has shops below and units ranging from one-bedrooms to triplexes above. Duplex penthouses take up the remaining parts of floors five and six. Despite similarities, all involved—client, architect, and Frankfurt’s historic preservation office—felt that two distinct facade solutions were necessary.

“Because many of the Lencoryt Building’s facade elements had been lost, we wanted to bring it back to life” says Gerrit Heidenfelder, the local preservationist overseeing this project. Working from historical documents, the architects restored original details made from rust-toned sandstone and cast concrete, such as the three- and four-story-high Corinthian columns; reconstructed the slate-clad mansard roof; and repaired the lobby’s carved oak doors, mosaic floors, and smoke-toned marble walls. Only double-glazing was permitted for the deeply recessed windows, placed in rebuilt wood frames.

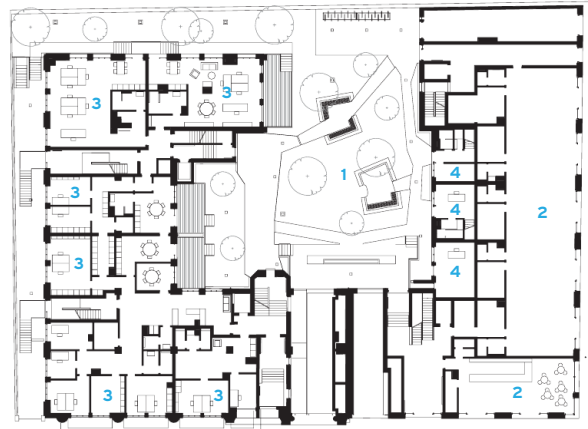




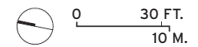
SITE PLAN



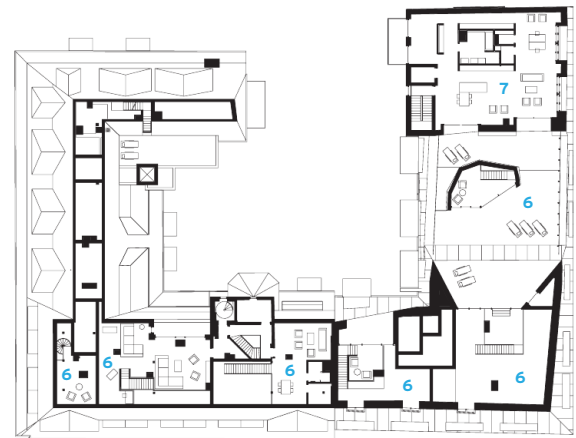
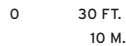
- 1 COURTYARD
- 2 RETAIL
- 3 OFFICE
- 4 TOWNHOUSE
- 5 APARTMENT
- 6 TWO-STORY PENTHOUSE
- 7 ONE-STORY PENTHOUSE



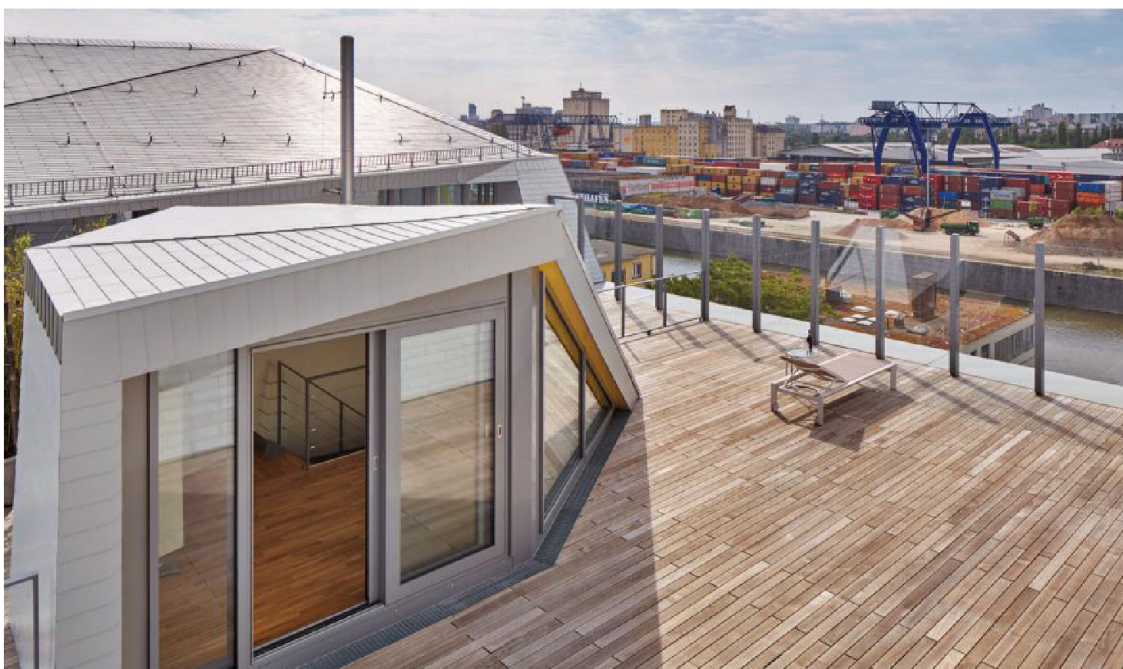
GROUND-FLOOR PLAN



SECOND-FLOOR PLAN



SIXTH-FLOOR PLAN



**CONTEMPORARY FACE** Penthouses connect to roof terraces (left). The new facade displays plasticity and rhythm in a bold choice of color (opposite).



To harmonize between the two, the architects felt that the new facade, like the historic one, should also display similar plasticity and rhythm, without imitating the landmark design. Because it was closer to the harbor and round-the-clock activity, the new facade required additional thickness to accommodate sound insulation.

The architects arranged fiber-cement panels to create a faceted surface extending from the 93-foot-high roof ridge to the base. Adjacent to the Lencoryt Building, the triple-glazed fenestration duplicates the dimensions of the older building. Facing the harbor, it becomes more irregular to compensate for the shift in the building's section. Platinum-gray diagonal bands are printed on some of the white panels, and when viewed from afar, they appear like horizontal folds casting elongated shadows across the surface.

According to Weyrich, a surprising number of older residents elected to live in the East Side Lofts because they desired an urban setting, although the ability to custom design one's unit may have been appealing too. The lofts were sold as raw spaces; for additional fees, 1100 Architect adjusted plans to suit individual needs. As a result, almost all of the 88 units, ranging from 480 to 2,200 square feet and with interior ceiling heights from 10 to 13 feet, have unique layouts. Most at mid-section have 7-foot-deep balconies facing the

courtyard, while the penthouses, some with 25-foot-high interiors, connect to roof terraces.

Two penthouse units, in the old and new sections respectively, displayed dove-toned, highly polished screed floors in combination with oak parquet, and kitchens (installed near the facade for natural illumination) that open onto continuous living-dining areas. The unit in the new section feels brighter, and the facade's deep canary-yellow window jambs provide a warm contrast to the surrounding industrial landscape. The unit in the Lencoryt Building is dimmer, yet traces of the past, including the exposed wood roof truss, a restored fan window, and entry via the revived lobby, make for a cozier ambience.

Completed in 2015, the East Side Lofts not only brings variety to Frankfurt's housing market, it enriches this urban landscape. Whereas the Lencoryt Building's refurbished facade preserves historical memory, the new exterior, when glimpsed from the harbor edge, appears like a site-specific artwork or a giant sail shifting gently in the wind. "We don't have graffiti problems with these buildings," says Weyrich. "I guess people like them." ■

*Berlin-based Mary Pepchinski is an author and architect who teaches at the University of Applied Sciences in Dresden, Germany.*

Carmel Place | New York | nARCHITECTS

# Living Small in the Big City

A building of micro-units introduces a new housing typology for New York's changing demographics.

BY JOANN GONCHAR, AIA



New York is infamous for its small living spaces—an apartment so teeny that its occupants must use the oven for storage, or a tenement so tight that the bathtub is in the kitchen. But now New Yorkers have the chance to live in something truly small—if much more functional—with the completion of

Carmel Place, a building with 55 apartments ranging from 260 to 360 square feet, in Manhattan, designed by Mimi Hoang and Eric Bunge, founding principals of nARCHITECTS.

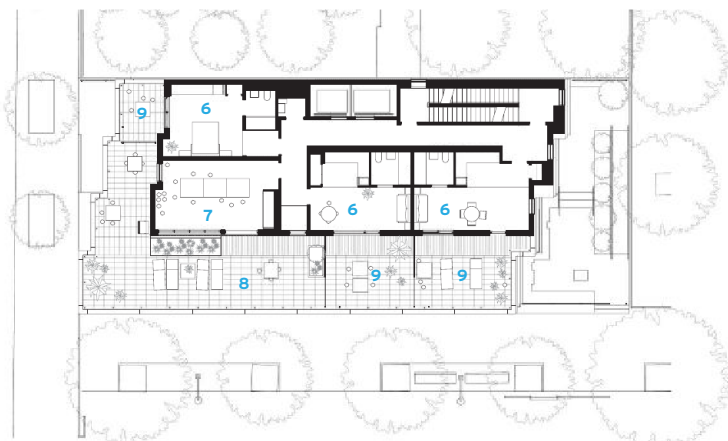
The project is the product of a pilot program launched in 2012 by Michael Bloomberg, then mayor. Its goal was the creation of a model for reasonably priced housing for New York's growing number of one- and two-person households. The competition brief asked teams to submit schemes for a city-owned 4,700-square-foot sliver of a site adjacent to a leafy park in the Kips Bay neighborhood. It called for a rental building that was at least 75 percent “micro-units”—apartments that are smaller than the standard studio. To make the project viable, certain zoning regulations were waived, including one in place since 1987 mandating that apartments be at least 400 square feet.

The developer, Monadnock, which has built a number of affordable and market-rate residential buildings in New York, approached Bunge and Hoang about entering the competition. The pair wanted to ensure that the tiny living spaces would be “humane,” says Bunge. “We thought, ‘We have to be part of the conversation.’” For its part, Monadnock was motivated by the challenge of making compact apartments that “felt good” and were more than merely “livable, but far better than the usual studio,” says Frank Dubinsky, the company's vice president.

The team's resulting \$12.95 million building, developed with a nonprofit partner, the Lower East Side People's Mutual Housing Association, has units arranged to create a nine-story, 35,000-square-foot structure that subtly steps in plan and section so that it reads like what Bunge calls a “micro-cosm of the skyline,” or as four miniature towers, each 11 feet wide and clad in a different shade of gray brick.

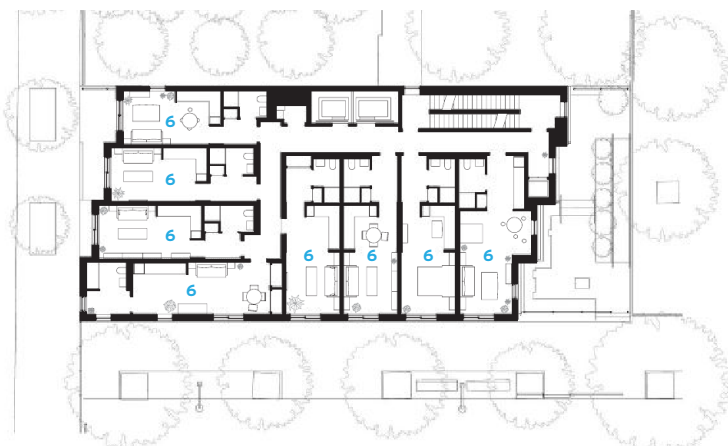
**SKYLINE IN MINIATURE** Carmel Place's 55 apartments, fabricated in a factory in Brooklyn, have been stacked to create a building that subtly steps in plan and section to form four minitowers (left and opposite). Each is clad in a different shade of gray brick.





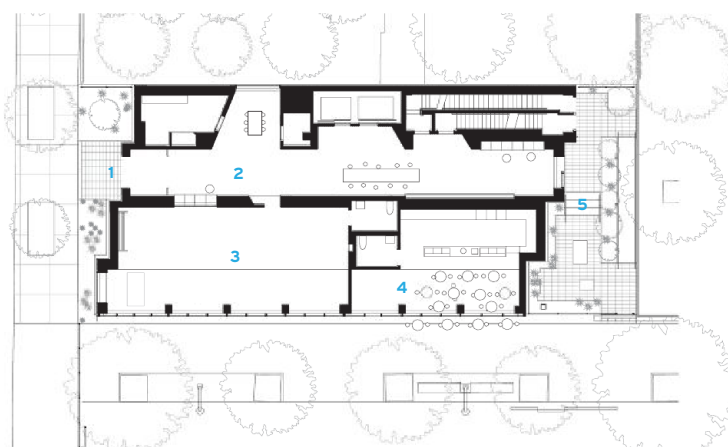
EIGHTH-FLOOR PLAN

0 20 FT.  
6 M.



TYPICAL-FLOOR PLAN

0 20 FT.  
6 M.



GROUND-FLOOR PLAN

0 20 FT.  
6 M.

- |            |             |                   |
|------------|-------------|-------------------|
| 1 ENTRANCE | 4 RETAIL    | 7 COMMUNITY ROOM  |
| 2 LOBBY    | 5 BACKYARD  | 8 SHARED TERRACE  |
| 3 GYM      | 6 APARTMENT | 9 PRIVATE TERRACE |



### credits

**ARCHITECT:** nARCHITECTS – Eric Bunge, Mimi Hoang, principals; Ammr Vandal, associate principal; Tony-Saba Shiber, Daniel Katebini-Stengel, Cheryl Baxter, Albert Figueras, Prathyusha Viddam, Gabrielle Marcoux, Amanda Morgan, Zach Cohen, Matthew Scarlett, Matthew Wilson, Alexis Payen, Christopher Grabow, Alex Tseng, Nancy Putnam, project team

**CONSULTING ARCHITECT:** Willis DeLaCour (competition phase)

**CONSULTANTS:** DeNardis Engineering (structural); A. Joselow (m/e/p); Langan Engineering (civil, landscape)

**GENERAL CONTRACTOR:** Monadnock Construction

**CLIENT:** Monadnock Development, NYC Housing Preservation and Development

**SIZE:** 35,000 square feet

**COST:** \$12.95 million

**COMPLETION DATE:** May 2016

**SOURCES**

**BRICK:** Glen-Gery

**CURTAIN WALL:** YKK AP

**GLASS:** JE Berkowitz

**CABINETWORK:** Spectrum Kitchens

**PAINTS AND STAINS:** Benjamin Moore

**ELEVATORS:** Kone



**MAKING AN ENTRANCE** The lobby (opposite), which stretches the length of the building, could accommodate a table for 100 residents and guests for a holiday celebration, according to the architects. The apartments' tall ceilings, blond wood floors, and glossy kitchen cabinets lend the living spaces an open and airy feel.

Completed in May, Carmel Place reveals little of how it was constructed: its steel-and-concrete apartment modules, along with 10 more for the stair and elevator core, were fabricated in a Brooklyn factory to take advantage of the benefits of off-site construction (see story, page tk). The modules were then stacked over the course of four weeks in late spring 2015 on top of a poured-in-place foundation and steel-framed first floor. The exterior bricks were laid on site, even though the project schedule potentially could have been shortened had the skin been completed in the factory. The architects opted for this method in order to bridge the joints between the units and emphasize the minitowers rather than the individual apartments, explains Bunge. "We were not interested in expressing the modules," he says.

Inside, the apartments are indeed compact, but they seem—especially when viewed without the clutter of actual tenants' possessions—light and airy. This feeling of spaciousness is in no small part due to the units' 9-foot 8-inch-high ceilings and their 8-foot-tall sliding windows with almost invisible glass balustrades, which create

the impression that the occupants can step directly outside. The finishes, including glossy white cabinets, back-painted glass backsplashes, engineered stone countertops, and blond wood floors, contribute to the fresh, clean look, as do the smart, vaguely Danish Modern furnishings that come with many of the apartments.

Although on the whole the units are very intelligently laid out, there are a few idiosyncrasies. One is a capacious bathroom that takes up nearly a quarter of a 360-square-foot corner apartment and claims two of its four windows. The room's overly generous size in comparison to the living space is the result of an emergency-exiting requirement that dictated the location of the bathroom door, explain the architects.

But such awkward instances are rare, and Monadnock is betting that the apartments' intelligent layouts and sleek aesthetic—along with a host of services and shared amenities—will attract tenants. These perks include free Wi-Fi, a cleaning and errand service, a gym, bike storage, game room, and top-floor community room with a roof deck overlooking the park. There is also the welcoming bamboo-paneled lobby with seating nooks, where Bunge imagines residents having Thanksgiving dinner. He says its 83-by-9-foot dimensions are perfect for a table long enough to seat 100 residents and guests.

This idea of community may be a bit farfetched, but the apartments



## SHAPESHIFTERS

Many of the units come with furnishings designed to perform multiple functions, such as the Murphy-style bed (below right), which folds out over the sofa (left) from a wall unit. The dining table (below left) converts to a narrow desk. The apartments have 8-foot-tall sliding glass windows protected by glass balustrades, which give residents the impression they can step directly outside.



are nevertheless clearly in demand. As of early August, about three quarters of the building's 32 market-rate apartments had been leased, even though their \$2,446- to \$3,195-per-month rents are more expensive on a square-foot basis than most Manhattan studios. (At the start of this year, the median rent for a studio in the borough was \$2,595.) According to Dubinsky, the tenants include empty nesters, people who are in the city only from Monday through Friday, and new graduates with their first jobs. "Micro-units aren't only for millennials," he says.

The remaining 23 apartments have long been spoken for: eight of the units are reserved for formerly homeless veterans, and 14 have been awarded, on the basis of a lottery to which 60,000 people applied, to

low- and middle-income residents. They pay from \$914 to \$1,490 per month. One unit is occupied by the building's superintendent.

Carmel Place clearly demonstrates that micro-units can be livable, even desirable, if they are thoughtfully designed. And they are sure to proliferate, especially now that the city formally modified the building code earlier this year to allow apartments that are smaller than 400 square feet as part of buildings with a mix of larger-unit types. But micro-units may not turn out to be the affordable housing solution that promoters contend they will be—especially if they inflate per-square-foot rents. It's still too early to determine if the compact living spaces will ameliorate, or exacerbate, the city's housing problems. ■





LIVE  
LEARN  
WORK  
CARE  
PLAY  
TRAVEL  
OUTSIDE

landscapeforms®

**Outdoor places are powerful. Outdoor Power enables connectivity in the places people want to be.**

Landscape Forms takes an important step in empowering outdoor experience with a family of mobile device charging stations that let people plug in and re-charge outdoors. This landscape-changing solution supports connectivity with three smartly designed models. All provide access to standard power and USB outlets, and all beautifully complement Landscape Forms site furniture solutions. Outdoor Power by Legrand takes power to places it's never been before.

Find us at [landscapeforms.com](http://landscapeforms.com) or contact us toll free at 877.831.9163.

**legrand®**

**CIRCLE 174**

# UNIQUE. DISTINCT. FACADES.



## WHY DRI-DESIGN?

Dri-Design Wall Panels with perforated imaging are the perfect blend of form and function. By varying the size, density and location of the perforations, areas of light, dark, and shades in between are created. And, because we can create the picture from any image or design, you have an endless palette of artistic expression. These perforations also perform a function by providing needed airflow and/or shade to a structure. ART and PERFORMANCE in one.

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



616.355.2970 | [dri-design.com](http://dri-design.com)

UMASS Lowell Parking Garage – Lowell, MA  
Architect: Bertaux + Iwerks Architects



# Toris®

Inspiring Creativity  
Through Performance®

EPIC Metals congratulates Architectural Record on 125 years of publishing success. Thank you for your commitment to excellence and the profound impact you've made on the architectural community for generations.

EPIC's product lines, including Toris, challenge the traditional concepts of generic structural roof deck by incorporating modern architectural principles combined with superior acoustics and multiple benefits. Contact EPIC for details.

**EPIC** METALS®

877-696-3742 toll-free 412-351-3913 tel  
epicmetals.com

Homewood Community Center—Homewood, Alabama  
Architect: Davis Architects—Birmingham, Alabama

# CAPTIVEAIRE

40 YEARS OF INNOVATION

*the complete solution*

COMMERCIAL VENTILATION SYSTEMS



CORE Fire Protection



Next Generation Exhaust Hood



Heating & Cooling Options



Stainless Steel Grease Duct



Demand Control Ventilation



Exhaust Fans

NOW SHIPPING FROM SIX LOCATIONS NATIONWIDE



Redding, CA



West Union, IA



Bedford, PA



Muskogee, OK



Youngsville, NC



Groveland, FL

*New Career Opportunities - We Are Hiring!*

Visit a *Display Center* near you!

[www.captiveaire.com](http://www.captiveaire.com)

1.800.334.9256



200 East 79th Street  
Photo credit: Amanda Rosen Photography

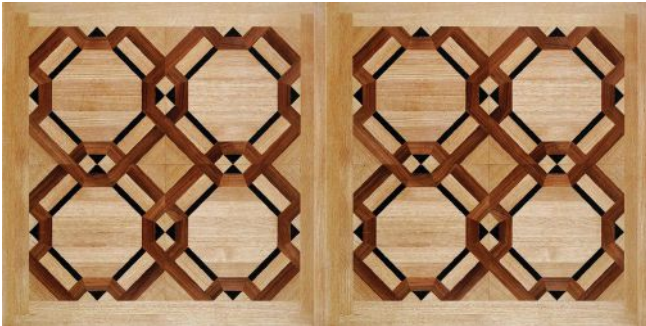


Photo credit: Janos P. Spitzer Flooring Consultants

## AdvanTech® Panels Integral Part of Floating Floor Systems in High-Rise Residential Projects

For over 50 years, Janos Spitzer has been renowned in the New York tri-state area for the finest custom hardwood flooring. He invests the time to understand each project's unique needs, evaluating everything from flooring system construction and material characteristics to pattern design and color palette.

Spitzer is currently advising clients on several high-rise residential projects in New York City, and he has turned to AdvanTech® panels to complete subfloor assemblies built with an ear on sound – or a lack thereof.

“In residential projects in New York City, there’s a demand for limiting sound transmission, so we need a subfloor assembly which is sound attenuated,” said Spitzer, the owner and founder of Janos P. Spitzer Flooring Company Inc. “This is achieved by having the subfloor assembly independently floating over the concrete slab without any mechanical connection.

“The assembly consists of two layers of 4' x 8' panels and an acoustical barrier,” Spitzer continued. “The system’s performance depends on its dimensional stability and, in this respect, AdvanTech panels outperform plywood that was traditionally used in the past. Unlike plywood, AdvanTech panels do not need the weight of the finish flooring to stabilize the assembly, since it is heavier than plywood, stays flat and is moisture resistant.”

Due to these characteristics, Spitzer said, builders can install the subfloor system throughout the project far ahead of the finish floor installation. As a result, finish flooring can be installed when all other trades completed their work, which greatly limits potential damage to finish flooring.

“The use of AdvanTech panels instead of plywood in the installation of sound attenuated wood flooring system gives us a great advantage in achieving superior quality and stability,” Spitzer said. ▀

Visit [www.AdvanTechPerforms.com](http://www.AdvanTechPerforms.com) to learn more.





# Movement Matters

The Active Workspace by Humanscale

[www.humanscale.com](http://www.humanscale.com)



Prodema

NATURAL WOOD BEAUTY

**WOOD makes  
the DIFFERENCE**

[www.prodema.com](http://www.prodema.com)

**PRODEMA NORTH AMERICA**

5582 N.E. 4th Court, 7B  
Miami, FL 33137 • Tel: 305-756-2062  
[sales@formasinc.com](mailto:sales@formasinc.com)

CIRCLE 191

HAMMOCK HOUSE (Miami)  
Shulman + Associates



**BEGA**

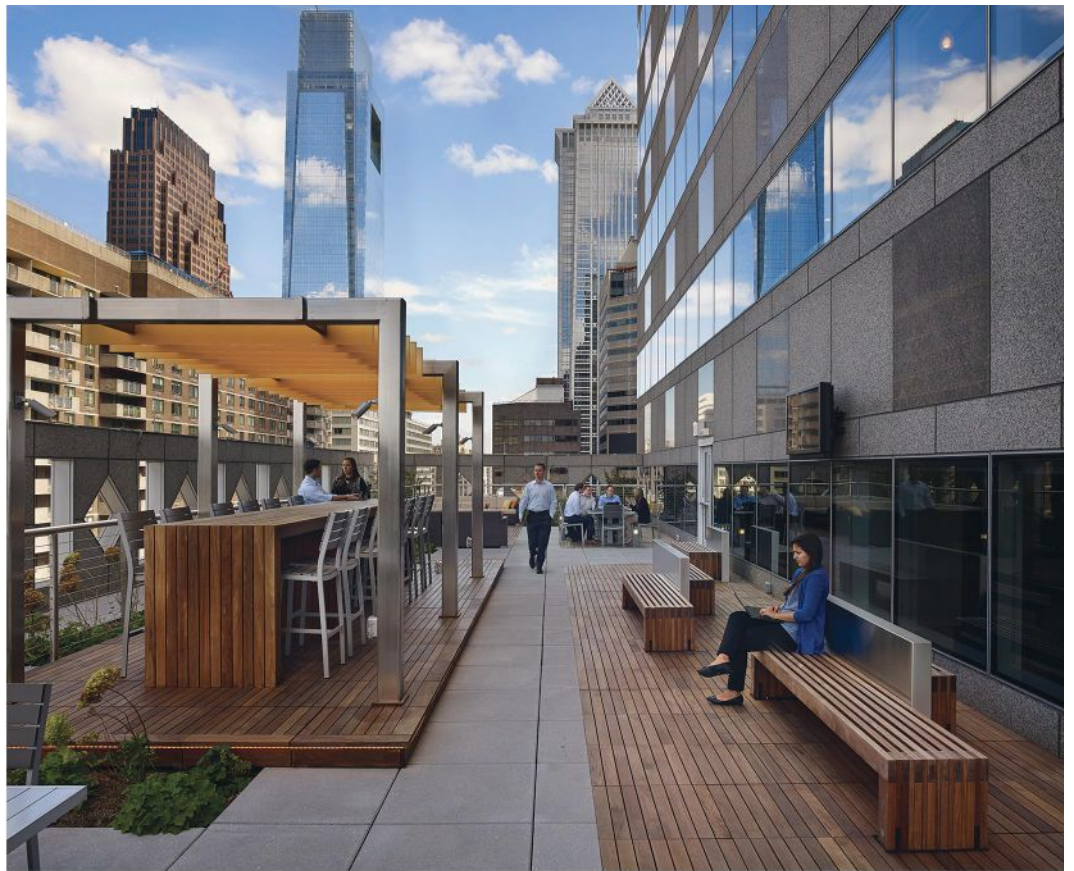
LED Pole Top luminaires  
Pedestrian scale glare-free illumination  
Translucent white or clear acrylic diffuser.



[www.bega-us.com](http://www.bega-us.com)  
(805) 684-0533  
No. 149

**CIRCLE 211**





*project:*  
Confidential Global Professional  
Services Firm (Philadelphia PA)  
*architect:*  
Vocon (Cleveland OH)  
*contractor:*  
Turner Construction (Philadelphia PA)  
*photographer:*  
Halkin Mason (Philadelphia PA)

**CIRCLE 210**

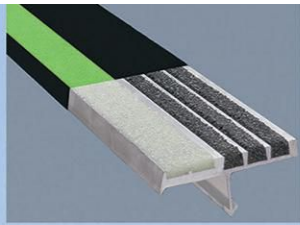
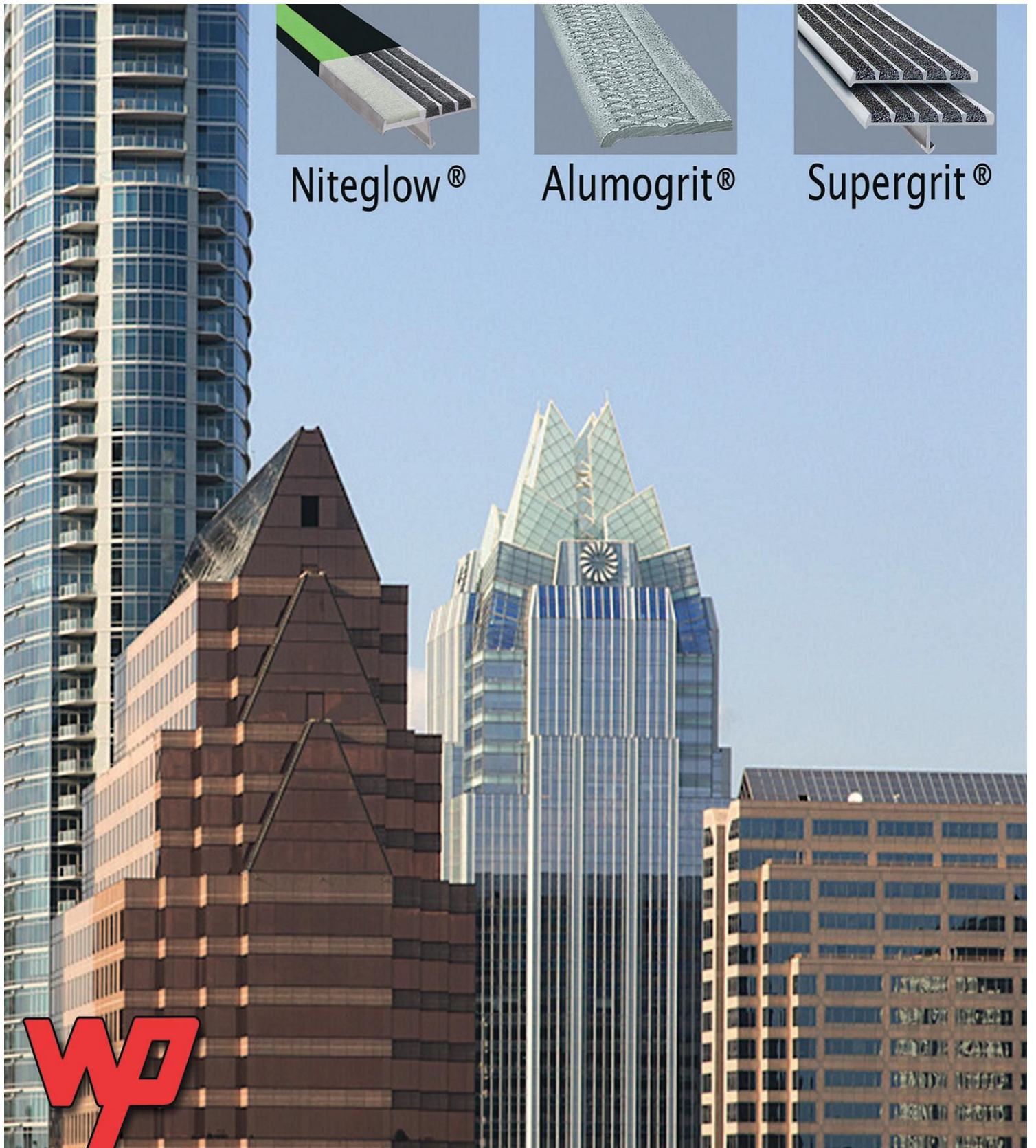
# CREATING ROOFTOP ENVIRONMENTS

Wood Tiles | Site Furnishings | Adjustable Pedestals

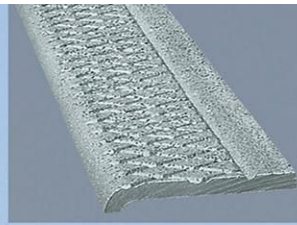


**Innovative Products**  
BisonIP.com | 800.333.4234

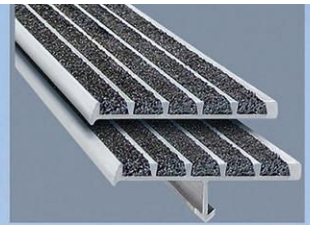




Niteglow®



Alumogrit®



Supergrit®



**Make Every Step A Safe One..** [www.wooster-products.com](http://www.wooster-products.com)  
**Wooster Products**  
**(800) 321-4936**

PROJECT: Sanford Consortium  
ARCHITECT: Fentress Architects  
ASSOCIATE ARCHITECTS: Davis Davis Architects  
LANDSCAPE ARCHITECT: Civitas, Inc.  
GENERAL CONTRACTOR: Hensel Phelps Construction Co.  
INSTALLER: Valley Crest Landscape Development



# DRIVABLE GRASS®

Access Lane



**SOIL RETENTION**  
Plantable concrete systems®

To learn more about Drivable Grass®,  
see our CEU "Design Considerations  
for Vegetated Permeable Pavements".

[www.soilretention.com](http://www.soilretention.com)  
800-346-7995

CIRCLE 91



# Pushing Prefabrication

From entire buildings to discrete components, the use of off-site construction is expanding across multiple building types.

By Russell Fortmeyer

**THE LOS ANGELES** structural engineer Richard Bradshaw talks about his first experience with large-scale prefabricated construction in terms that are less than affectionate. “It never really made sense to me,” he says now, more than 45 years later. Bradshaw worked with architect Welton Becket, who was collaborating with United States Steel and the Walt Disney Company to build a hotel, the Contemporary Resort, for Disney’s theme park in Orlando.

The three collaborators conceived the hotel, which opened in 1971, to demonstrate the potential for prefabrication in steel construction. U.S. Steel manufactured the nearly 500 rooms for the building’s main trapezoidal tower in a purpose-built factory on Disney

property a few miles from the site. There, workers not only built the individual room chassis—each approximately 9 feet high, 15 feet wide, and 30 feet long—but also installed interior finishes and furniture, including the television set. Once the modules arrived at the site, they were craned directly into the superstructure and hung on cables from its top bracing. To this day, each room is suspended above the still-operating hotel’s central atrium.

Like many prefabrication projects, the Disney hotel had several aims. These included accelerating construction, saving money, and illustrating Walt Disney’s vision of the city of the future. But “this was the end of their ex-

**PREFAB PIONEER** Disney’s Contemporary Resort hotel in Orlando, designed by Welton Becket and opened in 1971, included nearly 500 prefabricated guest rooms built in a factory less than two miles away.

periment,” says Bradshaw. Prefab at this scale did not immediately take off, he says, because of the immense investment needed to establish a nationwide factory network; the lack of predictable, precise execution in the precomputer era; and relatively low labor costs for conventional construction.

However, the dream certainly isn’t dead. For if the aims of prefabrication in architecture remain the same, the ways in which architects harness its potential now vary widely. Contemporary prefabrication operates at several scales, including that of specific systems like mechanical and plumbing distribution, building components such as facade units, and individual modular spaces like bathrooms, in addition to entire buildings. Prefabrication also represents a substantial share of new single-family residential construction.

Building typologies with significant programmatic repetition—hotels, multifamily housing, and student housing—still reap the greatest benefits from prefabrication. In 2004, the Dutch architecture firm Concrete conceived of its first prefabricated hotel project,



for the citizenM hotel brand. The Amsterdam hotel included a concrete core of elevators, stairs, and service risers and a concrete superstructure plinth upon which modular guest rooms, built by the Polish manufacturer Polcom, were stacked. The architects designed the rooms so that a single fully furnished module fit within a shipping container, for ease of transport.

The chain now has nine hotels. On a recently completed 370-room citizenM near the Tower of London, contractors stacked 30 units a week, shortening construction time by several months when compared to a conventionally built hotel. The brand's newest project, currently under construction and slated to open in 2017 on New York's Lower East Side, features 300 prefabricated guest rooms on top of a three-story concrete plinth. Concrete worked with local firm Stephen B. Jacobs Group to take their concept through construction. To save time, building department inspections for the rooms are being conducted

in Polcom's factory, with city inspectors from New York, so when each module arrives on-site, it is ready for installation.

"We didn't start with the idea of making it prefabricated," says Concrete's Erikjan Vermeulen, the firm's head of architecture. "We started with the idea of creating a better experience with less money, designing smarter space in a room of limited size, and then giving that saved space back with a ground-floor living room where people could socialize." The original citizenM concept featured conventionally built infill corridors, but Vermeulen says that created too many unknowns on-site that delayed construction. The new hotels incorporate the corridor into the room module. On-site, the contractors connect the plumbing, mechanical, and electrical services for each module; the highest floor of the concrete plinth—usually at level three—includes the building services equipment that feeds upward through the 15-story guest room tower.

Prefabrication helped San Francisco-based

architect David Baker to reduce on-site construction time by nearly a year on a housing project in Union City, California. Baker's client needed to accelerate construction to qualify for public money for transit-oriented development. So the architect took a modular approach for the 243 units, which include live-work lofts and one- and two-bedroom apartments.

Working with Guerdon, a manufactured-housing fabricator in Boise, Idaho, Baker conceived of the project, called Union Flats, with wood-framed modules 15 feet, 4 inches wide, 11 feet high, and up to 74 feet long to maximize shipping efficiency. Two modules create two one-bedroom apartments mirrored across a corridor through the middle, while three modules are needed for two-bedroom apartments in a similar configuration. To vary the floor plan, contractors can cut the modules in half through the corridor on-site.

As with the citizenM hotel rooms, inspections are conducted in Boise, so the units can



**PACKING LIGHT**  
The citizenM hospitality chain, which has nine hotels worldwide, including in London (left), constructs all guest room modules in Poland (opposite). The rooms, transported in shipping containers, arrive at the site with plumbing fixtures and furnishings installed (above).

remain locked throughout installation to avoid damage to the interiors. Each module's framing sits within a steel chassis. Once this is set into place, structural tabs on the modules are fastened to adjacent modules to create a consolidated structural system.

"Before the recession, we had a number of modular projects, but then framers needed jobs and costs came down for conventional construction," Baker says. "Now, modular wood-framed construction is competitive again with union-labor costs in many cities." In a factory, even union labor often costs less, he says, and the controlled conditions lead to higher quality, simpler construction methods, and fewer hazards compared to on-site circumstances. Although Baker is currently working on several modular projects, he believes prefabrication can sometimes have a negative impact on design, since shipping constraints prescribe dimensions, and connections for building services often dictate kitchen and bathroom placement.

Prefabrication can also compromise the appearance of a modular housing project, especially if the design emphasizes the technology's inherent repetitiveness. Baker notes that the Union Flats project looks indistinguishable from the conventionally constructed housing project his firm designed across the street. Since the units arrive on-site as waterproofed boxes wrapped in a single-ply membrane, a variety of cladding systems can be applied after they are stacked to conceal the joints between modules.

The biggest challenge to prefabrication is the irregularity of sites in dense urban environments, says Baker, since maximizing leasable living space often outweighs construction-cost savings from standardization. In dense cities, instead of full dwelling units, prefabricated kitchen and bathroom modules make the most sense, he says.

Baker also recommends that owners and architects weigh potential construction-cost savings against the expense of a large on-site

crane, which often accounts for the single-most significant construction expense for multifamily housing. "If you're good at it, you're lifting four units a day, but if you're really good, you can lift 12 units a day," Baker says, noting that at Union Flats they averaged between 11 and 12 modules a day. He predicts that prefabricated multifamily housing could one day displace conventionally built apartment buildings in California, given the endemic housing shortages in the state.

Modular construction is also making inroads in health-care facilities, but not in the manner one might expect. Prefabrication has not been widely adopted for hospital-patient rooms. However, architects have found that some individual systems within these complex buildings lend themselves particularly well to prefabrication.

Designers with NBBJ's Columbus, Ohio, office initially developed a prefabrication approach to patient toilet rooms, head walls, casework, and building-services utility racks for the Miami Valley Hospital in Dayton, which opened in 2010. The client was interested in the idea of the universal patient room, where standardized systems and architecture could serve a variety of clinical situations, from intensive care to basic medical-surgery nursing units. But after studying the potential for a fully prefabricated room—akin to the citizenM hotel approach—and finding scant possibility for savings, the architects worked with construction manager Skanska toward more discrete prefabricated components to realize savings of time and money.

"We learned many lessons on Miami Valley," says Tim Fishking, an NBBJ principal. The biggest lesson was minimizing the need for



**STACKING THE DECK** David Baker's Union Flats, a 243-unit apartment building in Union City, California (above), is made up of modules built in Idaho (below, left). Cladding is installed on-site, after the modules are stacked (below, right).

warehouses to temporarily store prefabricated components prior to on-site installation. So for its second prefabrication project, the OhioHealth Riverside Methodist Hospital, which opened in 2015 in Columbus, NBBJ worked with the contractor to streamline the schedule to engender a "just-in-time" approach for the prefabricated systems. This allowed elements like head walls and utility racks to be shipped to the site for the 224-bed, 437,000-square-foot neuroscience, vascular, and cardiac-care hospital as soon as they were ready.

At Riverside, whole mechanical and electrical distribution racks were laid out in the prefabrication shop based on the hospital's

corridor design and GPS coordinates established on the construction site. Joints in the racks aligned with the radius of the corridor's curve, so each 20-foot-long and 8-foot-wide section could be transported to the site and then hung from the ceiling and attached to adjacent sections to create continuous runs of services such as chilled and hot water, oxygen, nitrogen, and fire sprinklers. "You didn't have this scenario of 'who got there first' that forces trades to reroute their work around others," says Fishking. "It also improves the owners' ability to maintain the facility, because they know each rack is identical."

Prefabricated systems and components at Riverside also included single-stall toilet rooms, head walls in patient bays and exam rooms, utility racks above the operating rooms, plumbing zone valve boxes, and even entry canopies. The project was complete six

months before the planned opening date, an accomplishment Fishking attributes, in large part, to prefabrication.

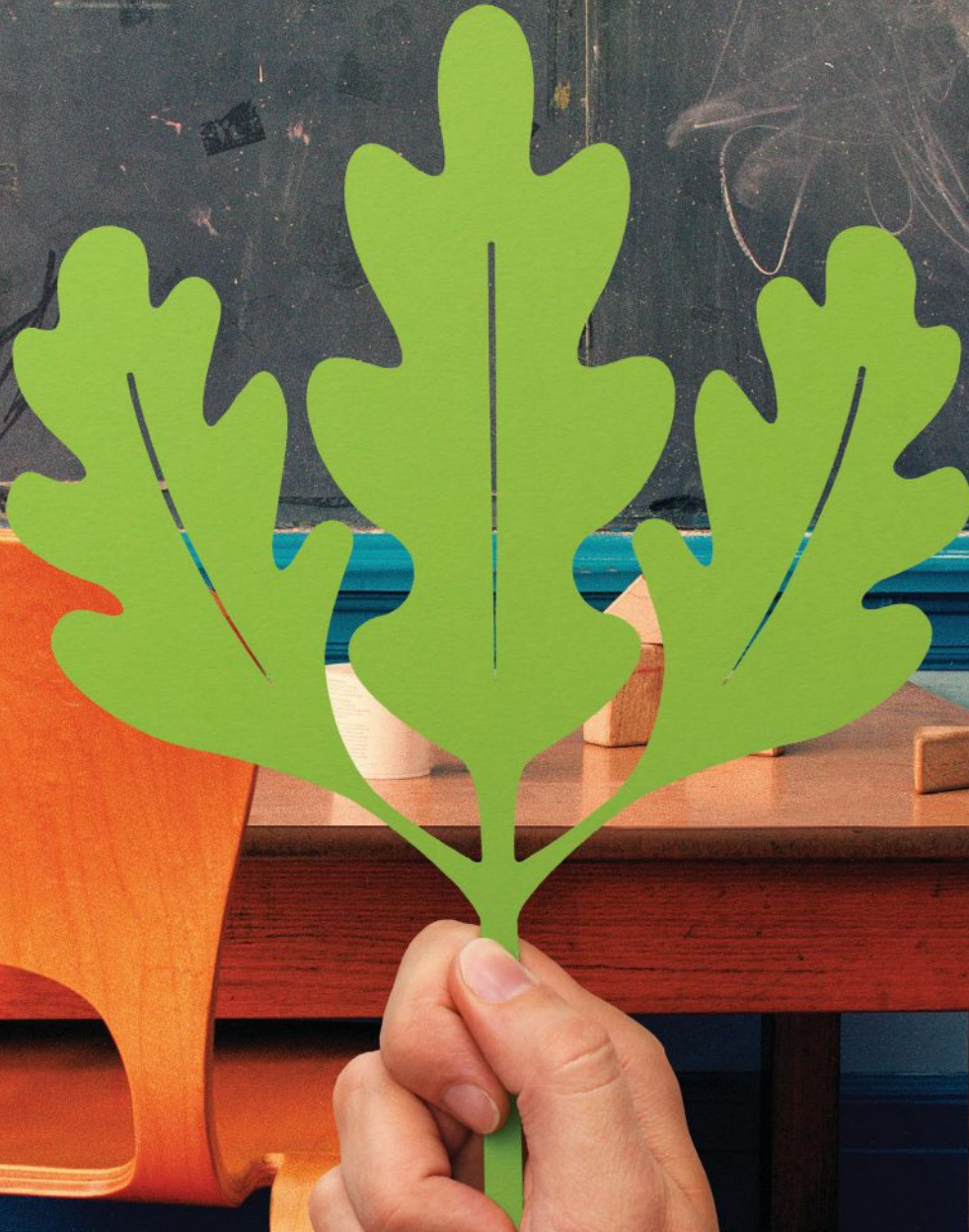
Ryan Hullinger, also a principal in NBBJ's Columbus office, says successful prefabrication depends on getting it right in virtual design. "So much work has to go into testing patient rooms for dozens of clinical scenarios to ensure it works in those situations," says Hullinger, who also recommends extensive physical mock-ups.

Some of the firm's upcoming hospital projects include extensive renovation, where Hullinger envisions even more benefits for a prefabrication approach. "A typical hospital-wing renovation includes demolition and significant downtime while you build new rooms," he says. "With prefabrication, you could build the patient rooms off-site during the demolition phase and vastly reduce that





# We LEED in the classroom.



LEED, the most widely used green building program, is helping buildings and homes everywhere use less water and energy, provide a healthier environment for occupants, and save money.

LEED—a commitment to the environment and a commitment to people.

**#FindyourLEED**

CIRCLE 28



[usgbc.org/LEED](http://usgbc.org/LEED)



**HEALTHY APPROACH** NBBJ's OhioHealth Riverside Methodist Hospital (top) incorporated prefabricated patient room head walls and toilets (middle and bottom) to shorten construction and simplify multi-trade coordination.

downtime." It's similar to the schedule savings on new construction projects, where site preparation often occurs in parallel with the factory fabrication work.

With the renewed interest in prefabrication, it's sometimes easy to overlook the fact that unitized facade systems remain the most common form it takes in buildings. But some industry experts believe that prefabrication is also the answer for facades with complex geometries that would otherwise have to be achieved through time-consuming on-site labor. Technologies such as 3-D printing or robot-enabled construction could pave the way for envelopes with even more exuberant shapes and a higher level of intricate detail. But, regardless, the aims will be the same as they have always been—to build faster, better, and more cheaply. ■



Russell Fortmeyer leads sustainable design for the Los Angeles office of Arup and teaches at the Southern California Institute of Architecture.

#### Continuing Education



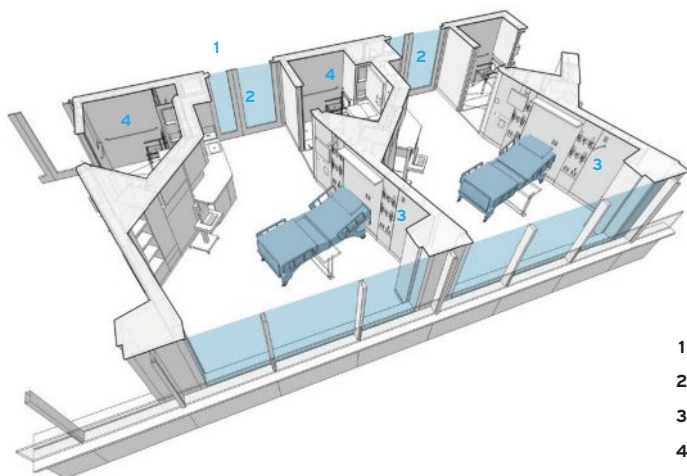
To earn one AIA learning unit (LU), including one hour of health, safety, and welfare (HSW) credit, read "Pushing Prefabrication," review the supplemental material at [architecturalrecord.com](http://architecturalrecord.com), and complete the online test. Upon passing the test, you will receive a certificate of completion, and your credit will be automatically reported to the AIA. Additional information regarding credit-reporting and continuing-education requirements can be found online at [continuingeducation.bnpmmedia.com](http://continuingeducation.bnpmmedia.com).

#### Learning Objectives

- 1 Describe how project teams are using prefabrication as an alternative to traditional construction methods and explain how the approach can save time and money, and reduce construction waste.
- 2 Outline which building typologies and components are best suited for prefabrication.
- 3 Explain why off-site construction can result in better-performing buildings and safer construction sites.
- 4 Discuss the role of virtual construction and digital technology in prefabrication.

**AIA/CES Course #K1609A.**

FOR CEU CREDIT, READ "PUSHING PREFABRICATION" AND TAKE THE QUIZ AT CONTINUING-EDUCATION.BNPMEDIA.COM, OR USE OUR ARCHITECTURAL RECORD CONTINUING-EDUCATION APP, AVAILABLE IN THE ITUNES STORE.



- 1 CORRIDOR
- 2 ROOM ENTRY
- 3 HEAD WALL
- 4 BATHROOM

HOSPITAL ROOM DIAGRAM

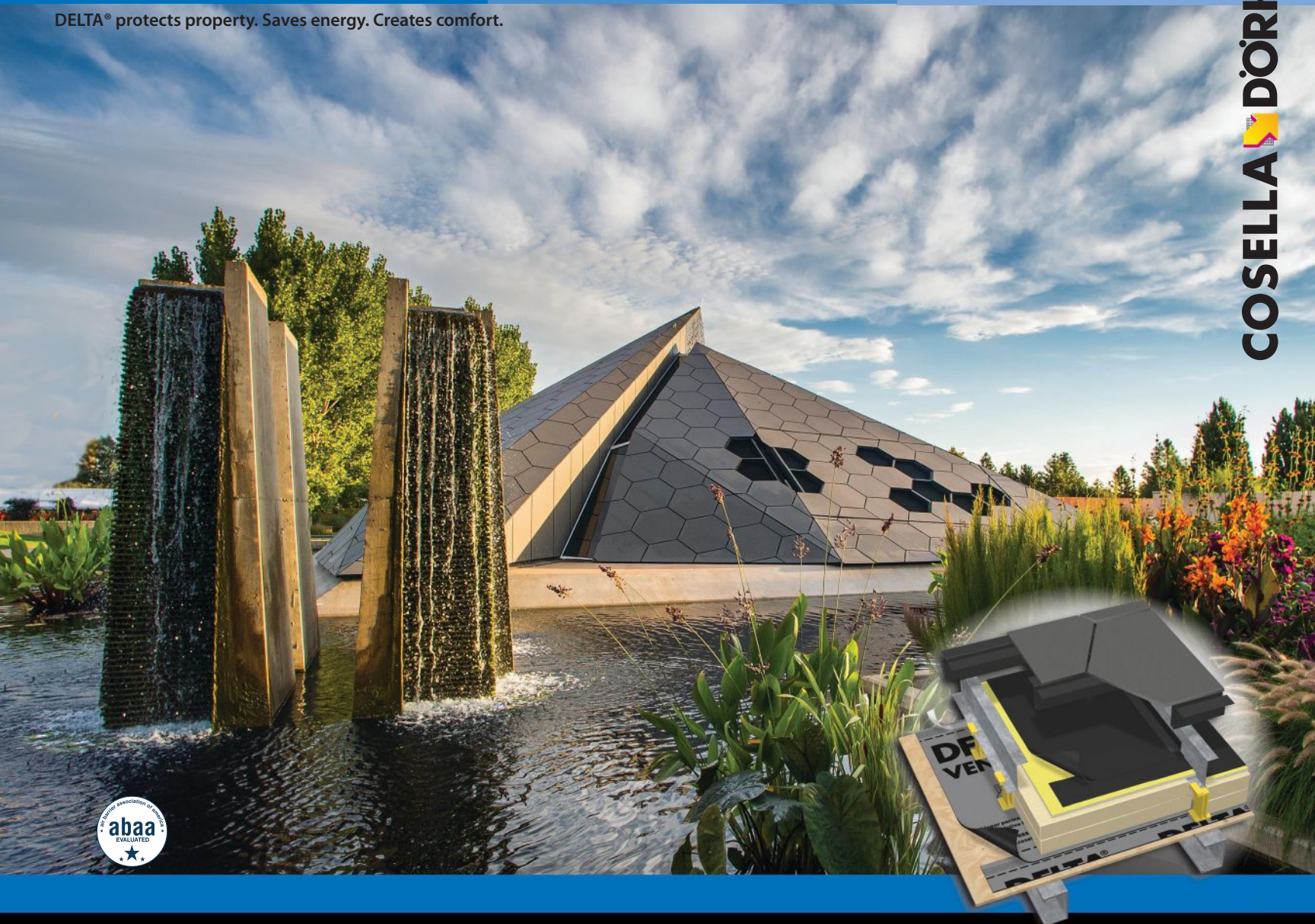


## ALECK WILSON.

I'm a third generation San Francisco architect. Like my father and grandfather, I've always enjoyed designing with redwood. It's a durable material that shrinks in a more stable manner, and maintains its architectural integrity. We use it for timbers. We use it for paneling. We use it because of its warmth and depth of color. But for me, it's even more than that. For me, it's a little bit of family history. Get inspired by projects that architects like Aleck Wilson have built with redwood at [GetRedwood.com/Aleck](http://GetRedwood.com/Aleck).

CIRCLE 196

**REDWOOD**  
REAL. STRONG.



## Creative Building Design Requires High-Performance Membrane Solutions.

The Denver Botanic Gardens Science Pyramid presented a unique air and moisture challenge. The pyramid shape, usage, and open cladding multiply the complexity of maintaining a watertight exterior while managing the moisture generated within.

Two air and moisture barriers, DELTA<sup>®</sup>-VENT SA and DELTA<sup>®</sup>-FASSADE S ensure an airtight and watertight enclosure that manages moisture in a complex Colorado climate. The UV-resistant, matte black DELTA<sup>®</sup>-FASSADE S adds depth and dimensionality to the open cladding, heightening the striking appearance of this landmark building.

When architects want to push the boundaries of building design, one of the biggest complications is moisture control. High-performance solutions like DELTA<sup>®</sup> products will allow architects full artistic freedom while giving them the confidence of a leak-free building. If you are designing a unique structure, don't hesitate to contact DELTA<sup>®</sup> to protect you from future moisture issues.

### DELTA<sup>®</sup>-VENT SA

Vapor permeable self-adhered water-resistive barrier & air barrier.

### DELTA<sup>®</sup>-FASSADE S

UV-resistant water-resistive barrier for open joint claddings.

NAMED  
2015 BUILDING  
OF THE YEAR

BY THE SEATTLE DAILY  
JOURNAL OF COMMERCE

# HIGH PERFORMANCE IS

*Building a Better Barrier*

**Dow Corning® DefendAir 200:**  
The only water-based silicone air barrier  
complemented by a fully compatible system.

Discover how Cornish College of the Arts (pictured above) protected design integrity and sealed its building envelope with our complete, warranted silicone weatherproofing system.

Read the case study and learn more about Dow Corning's air and water barrier solutions at [BuildaBetterBarrier.com](http://BuildaBetterBarrier.com).



Photo courtesy of Ankrum Moisan Architects and photographer Casey Braunger. ©Ankrum Moisan Architects. Dow is a registered trademark of The Dow Chemical Company. Dow Corning is a registered trademark of Dow Corning Corporation. The Corning portion of the Dow Corning trademark is a trademark of Corning Incorporated, used under license. ©2016 Dow Corning Corporation, a wholly owned subsidiary of The Dow Chemical Company. All rights reserved. AV25119.



DOW CORNING

Building and Construction  
Solutions



CIRCLE 220

At home with perfection.  
Created with simple, clear forms.



To see what else bulthaup kitchens have to offer, please contact  
your local retail partner [www.en.bulthaup.com/dealers](http://www.en.bulthaup.com/dealers)

Boston, Chicago, Dallas, Denver, Houston, Los Angeles, Miami,  
New York, Philadelphia, San Francisco, Santa Monica, Scottsdale,  
Toronto, Vancouver, Washington DC



WE'RE NOT SAYING  
REAL CEDAR MAKES  
A BETTER-LOOKING  
HOME.

WELL... ACTUALLY,  
YES WE ARE.

WESTERN RED CEDAR HAS A DEEP, RICH,  
NATURAL LUSTRE AND LOOK THAT NO  
OTHER MATERIAL CAN MATCH.

It's the kind of beauty that can only come from real  
wood. What's more, Real Cedar is naturally resilient  
to the elements, long-lasting, and third-party certified  
sustainable. And we're not just saying that because we  
think it's a better material for your projects.

Well, actually...



For more information on specifying Real Cedar  
for your next project, contact us today.

1 866 778 9096 | [REALCEDAR.COM](http://REALCEDAR.COM)

CIRCLE 167

Architecture by  
Rangr Studio with  
Charlet Design

# Outperform rigid board insulation on every level. Including price.

Discover a better option than rigid foam board, with Icynene ProSeal spray foam insulation. From cost, performance, to design capabilities, it's the superior choice. Find out more at [icynene.com/whyproseal](http://icynene.com/whyproseal).



CIRCLE 234

  [icynene.com/whyproseal](http://icynene.com/whyproseal)



# The World Standard in Concrete Waterproofing by Crystallization

**NO  
EQUAL**



CIRCLE 200

Electron Microscope Images are the property and copyright of Xypex Chemical Corporation.



Concrete  
(Untreated)



Xypex Crystallization  
(Initiated)



Xypex Crystallization  
(Mature)

XYPEX integral crystalline technology waterproofs concrete foundation structures as they're poured and cannot be damaged during installation or backfilling. Unlike membranes, Xypex is added to the concrete at the time of batching avoiding application errors. This sustainable technology also contributes to LEED credits. **When you select Xypex Crystalline Technology**, you've chosen the best... more than 40 years of independent testing, experience in over 90 countries, unmatched product and service standards... *and still no equal.*

CIRCLE 200

Call 1.800.961.4477 or visit us at [xypex.com](http://xypex.com)

**XYPEX**<sup>®</sup>



**STARTS  
STRONG.  
STAYS  
STRONG.  
REAL-WORLD PROVEN.  
JM TPO.**



**OPEN NOW  
FOR ENTRIES**  
[www.lafargeholcim-awards.org](http://www.lafargeholcim-awards.org)

# GOT A BETTER IDEA?

## Total Prizes of \$2 Million

We are committed to sustainable construction and projects that support PROGRESS - PEOPLE - PLANET - PROSPERITY - PLACE.

### Enter your project in one of these categories:

- Architecture, building and civil engineering
- Landscape, urban design and infrastructure
- Materials, products and construction technologies

Professional and Next Generation awards.



*LafargeHolcim Awards Silver 2014 – \$50,000 USD. Lieu de vie on the new Paris-Saclay university campus hosts a mix of activities including indoor and outdoor sports facilities, food outlets and various public spaces across more than 4,000 sq m of floor area. Using rough materials, robust and long lasting techniques, the “urban shelf” is organized vertically with its different activities superimposed on one another, using the roof as a panoramic playground for football and basketball games. Paris, France*



*LafargeHolcim Awards Silver 2014 – \$50,000. The Dryline (BIG U) addresses the vulnerability to coastal flooding with a protective ribbon in Southern Manhattan. Embankments that add green areas and spaces beneath elevated roadways are built out with pavilions for public use. New York, NY*



*LafargeHolcim Awards “Next Generation” 3rd prize 2014 – \$25,000. Developed by students at MIT, Pleura Pod: Air purification wall transforming carbon dioxide into oxygen. Pleura Pod is a wall that is composed of multiple layers that are made out of natural or recycled materials. Cambridge, MA*



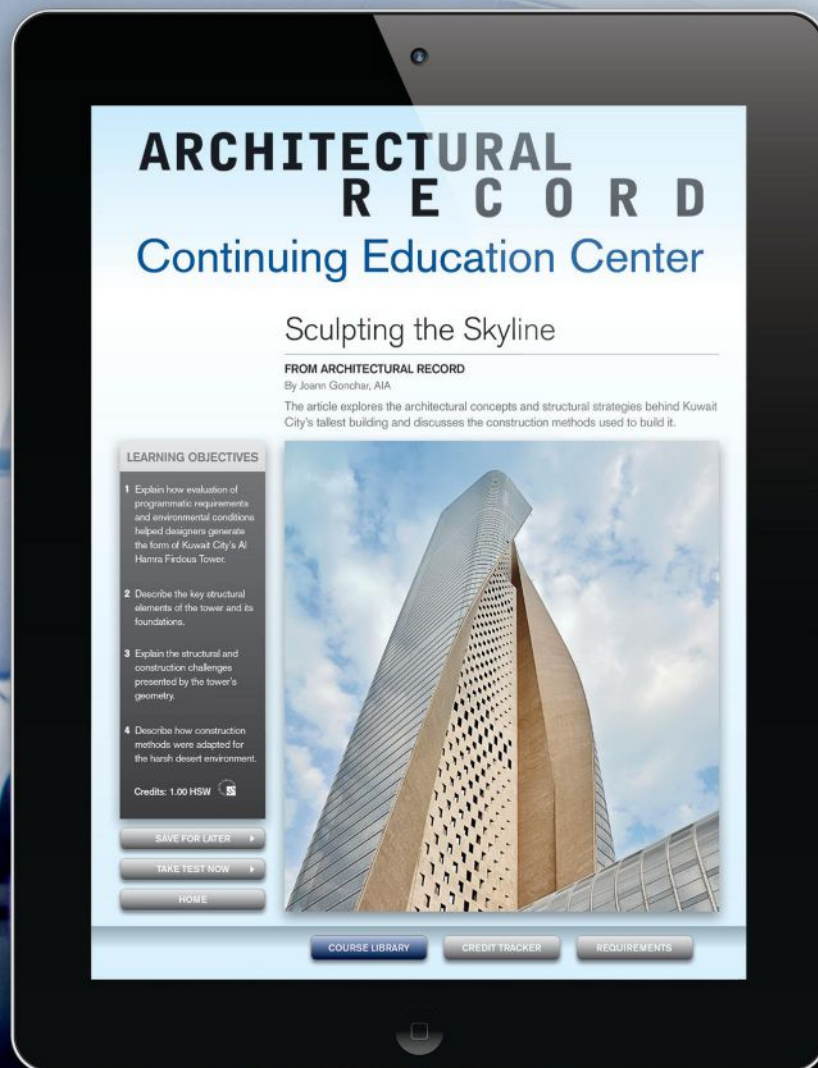
*Global LafargeHolcim Awards “Innovation” Silver 2009 – \$50,000. Self-contained day labor station is a minimal physical urbanistic intervention with maximum social equity and neighborhood enhancement effects. San Francisco, CA*

**For more information: [application.lafargeholcim-awards.org](http://application.lafargeholcim-awards.org)**

# LafargeHolcim Awards

# LECTURE HALL.

Introducing the Architectural Record CEU App. The only app that allows you to fulfill credits and track your progress without Internet access.



Download free at iTunes.

Sponsored by  
reTHINK  
**WOOD**®

Natural

Elegant

Luminous



The only thing missing is you.  
Live Your Life In Stone



ARABESCATO CORCHIA



MA'S CONCRETE

sandstone  
quartzite

marble  
granite

limestone  
travertine

New York 718.389.8360

ABCworldwidestone.com

Long Island 516.997.9412

artisan mosaic  
semi-precious

french flooring  
engineered-stone

exterior  
landscape stone

Columns and floors feature MA's Concrete, a seamless, ultra-thin, decorative concrete available exclusively through ABC Stone. Phone with inquiries.



Natural

Elegant

Luminous

The only thing missing is you.  
Live Your Life In Stone



BELVEDERE



PORTORO

The Skull Table in Belgium Black Marble by John Bizas for ABC Stone.  
Price Upon Request.

New York 718.389.8360

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

Long Island 516.997.9412

sandstone  
quartzite

marble  
granite

limestone  
travertine

artisan mosaic  
semi-precious

french flooring  
engineered-stone

exterior  
landscape stone

ABC stone





# CONTINUING EDUCATION

CONTINUING EDUCATION

In this section, you'll find seven compelling course highlighting creative solutions for tomorrow's buildings—brought to you by industry leaders. Read the courses and then go to our online Continuing Education Center at [ce.architecturalrecord.com](http://ce.architecturalrecord.com) to take the tests free of charge to earn AIA Learning Units (LUs), Health Safety Welfare (HSW), Green Building Certification Institute (GBCI), and Interior Design Continuing Education Council (IDCEC) credits.



Photo courtesy of Thermocromex

p226

## Twenty-First Century High-Performance Limestone Plaster

Sponsored by THERMOCROMEX

BE PM SU

CREDIT: 1 AIA LU/HSW;  
1 GBCI CE HOUR

Photo courtesy of Metl-Span

p228

## Insulated Metal Panels On the Roof

Sponsored by Metl-Span

BE PM SU

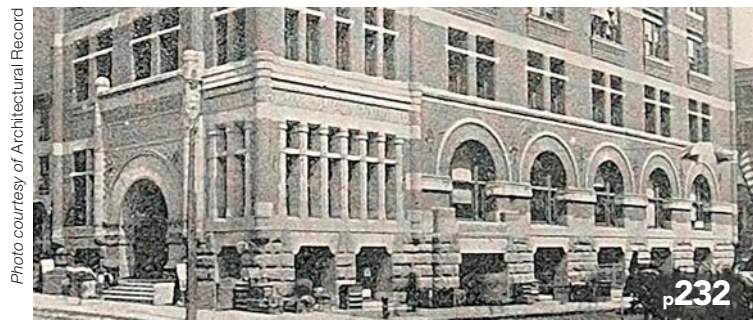
CREDIT: 1 AIA LU/HSW;  
1 GBCI CE HOUR

Photo courtesy of Architectural Record

p232

## 125 Years of Product Innovation and Evolution

Sponsored by Armstrong® Ceiling Solutions, Excel Dryer, Inc., Guardian Glass North America, NanaWall Systems, and National Terrazzo &amp; Mosaic Association

IN PM SU

CREDIT: 1 AIA LU/HSW



© Zahid Chafar

p242

## Mind the Gap

Sponsored by LogiSon Acoustic Network

AC IN PM

CREDIT: 1 AIA LU/HSW;  
0.1 IDCEC CEU

Photo courtesy of Icnene

p244

## Moisture Control with Spray Foam Insulation

Sponsored by Icnene

BE PM SU

CREDIT: 1 AIA LU/HSW;  
1 GBCI CE HOUR

Photo courtesy of LEVER Architecture

p248

## Mass Timber in North America

Sponsored by reThink Wood

PM ST SU

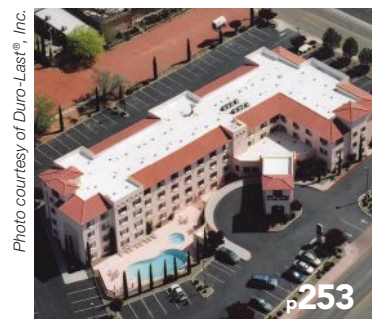
CREDIT: 1.5 AIA LU/HSW;  
1.5 GBCI CE HOURS; 1 PDH

Photo courtesy of Duro-Last®, Inc.

p253

## Reflective Roofs and Urban Heat Islands

Sponsored by Duro-Last®, Inc.

BE PM SU

CREDIT: 1 AIA LU/HSW

### CATEGORIES

**AC** ACOUSTICS  
**BE** BUILDING ENVELOPE DESIGN

**IN** INTERIORS  
**PM** PRODUCTS AND MATERIALS

**ST** STRUCTURAL  
**SU** SUSTAINABILITY

The architect achieved a smooth, monolithic exterior at this art center in Miami by selecting a high-performance limestone plaster cladding.

Photo courtesy of Thermocromex



# Twenty-First Century High-Performance Limestone Plaster

Historic exterior finish material meets modern environmental performance criteria

Sponsored by THERMOCROMEX | *By Celeste Allen Novak FAIA, LEED AP, BD+C*

The aesthetics and performance of an exterior material are prime elements that every design professional investigates when selecting an exterior finish. For those who are seeking environmental benefits, materials must meet high-performance attributes, particularly in the areas of energy savings, moisture control, and material components that are not harmful to the environment. It may be surprising that architects are discovering that a new material with environmental performance values that exceed codes is also an ancient material. High-performance limestone plaster, or HPLP, is a new term for an ancient material composed of natural hydraulic lime, hydrated lime, and elongated sand. Through research, third-party testing, and quality controls, HPLP exterior cladding is available using the same materials as historic high-performance lime plasters.

Architects are using this product to achieve the highest of environmental building ratings in contemporary architecture and as a material that radiates light and permanence, while providing energy savings, moisture control, breathability, and strength.

## RAW MATERIALS MATTER: UNIQUE ST. ASTIER LIME

To get the quality needed to meet the durability, breathability, and flexibility required for use at the renovation of the Michigan State Capital, preservation architect Eugene C. Hopkins, FAIA, principal at HopkinsBurns Design Studio, chose a hydraulic lime plaster from St. Astier in France. He recommended the use of lime plaster because it is an authentic and proven material, saying, “We tested the original plaster and mixed the same ratios of sand and

## CONTINUING EDUCATION



1 AIA LU/HSW



1 GBCI CE HOUR

### Learning Objectives

After reading this article, you should be able to:

1. Define high-performance limestone plaster cladding and compare its historic use in Europe to modern performance criteria.
2. Describe the environmental and durability benefits of using this material for strength, moisture control, defenses against mold, mildew, breathability (perm rating), and air permeance.
3. Evaluate the use of this exterior cladding as part of a project attaining a green building rating that requires materials to be in compliance with the USGBC's REACH legislation documentation and those that have published Health Product Declaration Open Compliance Standards.
4. Explain why this material requires no control joints when applied to a mass wall, providing a new alternative for designers choosing smooth, monolithic exterior finishes.
5. Discuss the advantages of using an integrally colored stone material that requires no painting or recoloring and can be matched for additions or renovations.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

AIA COURSE #K1609B  
GBCI COURSE #0920009883



Photo courtesy of Thermocromex

lime using a three-coat application. We also installed horsehair in the brown coat. The previous system lasted for 100 years so why mess it up?” Preservationists choose lime from St. Astier because of its unique geologic location. The purity of hydraulic lime from St. Astier guarantees a product that provides high-performance environmental benefits. The Louvre, Westminster Castle, and Notre Dame are just some of many famous buildings that were constructed using St. Astier lime.

The lime deposits at St. Astier are located between the French cities of Montceaux and Neuville sur l'Isle (approximately 6.2 miles). This geological layer is more than 328 feet thick. It was formed during the Upper Cretaceous period (approximately 75 million years ago) by marine sediment (mostly crustacean and corals). The sea in the basin was not subject to severe currents, and this allowed the formation of a uniform and undisturbed layer of calcareous rock infiltrated mainly by silica, with insignificant traces of other elements. This characteristic of the rock is unique in Europe and is the reason why the lime used for historic preservation is so reliable. It has the highest concentration of lime without any impurities. Archeological evidence shows that since the time of the Romans, this lime was used in buildings. In 1833, Louis Vicat, a French engineer and authority in hydraulic limes, began industrial production of the lime at St. Astier for use all over the world.<sup>1</sup>

Fast forward to the 21<sup>st</sup> century and to architects who want to choose this high-performance historic material without the labor-intensive applications with horsehair brushes, multiple coats, and long drying times. HPLP is manufactured with strict product control of the materials that include lime and sand components. It can be applied in one coat, sprayed onto a variety of substrates in a one-coat finish with quick drying times. The basic components of high-performance limestone plaster include:

#### Hydrated Lime

Limestone is a calcareous rock that is extracted from the St. Astier quarry and crushed to create quicklime. During a highly controlled production process, water is added to create hydrated lime. A calcareous rock is a term used to identify a sediment, sedimentary rock, or soil type that is formed from, or contains a high proportion of, calcium carbonate in the form of calcite or aragonite.



Limestone plaster was directly applied to new CMU and existing precast concrete along with frame/sheathing wall assemblies to achieve uniformity in texture and color at the Dallas Fort Worth International Airport (DFW).

The properties of lime make it a strong contender as a “miracle” building product. These include: “cohesion, adhesion, air content, water content, crystal shape, board life, spreadability, and flowability; bond strength; comprehensive strength; setting time; sand-carrying capacity; hydrolocity; free lime content; vapor permeability; flexibility; and resistance to sulfates. These qualities are affected by many factors during each step of manufacturing and installation. These include the original ingredients of the source of lime; added ingredients before and during firing, including inclusion of compounds from the fuel exhaust; firing temperature and duration; method of slaking, including a hot mix (quicklime added to sand and water to make mortar), dry slaking, and wet slaking; ratio of the mixture with aggregates and water; the sizes and types of aggregate; contaminants in the mixing water; workmanship; and rate of drying during curing.”<sup>2</sup>

#### Natural Hydraulic Lime

Hydraulic lime is the product of burning and slaking limestone. Natural hydraulic lime, or NHL, refers to the hydraulic properties of the selected lime product as a raw material with no additions, such as cement. The 21<sup>st</sup> century production process for HPLP is essentially the same as the one used since ancient times.

The scientific knowledge of the manufacturer and modern quality control have, however, the favorable effect of producing reliable materials with constant performance. The method and the energy used in the burning process are the determining factors in the quantity of silica that combines with calcium oxide (CaO) to form calcium silicates (CS). This produces the environmental and durable performance of the finished products. Burning takes place in vertical kilns at temperatures not above 1,832 degrees Fahrenheit (1,000 degrees Celsius). The most efficient fuel with the least residuals is a high-quality anthracite coal imported from Wales and used at St. Astier. Continuous checks are made to measure the efficiency of the burning (CO<sub>2</sub> tests), which are essential to regulate the hydration that follows. Hydration or slaking is a controlled hydration process. This process is so precise that virtually no quick lime (less than 1 percent) or impurities will be present at the end.

► Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)

**Celeste Allen Novak, FAIA, LEED AP BD+C,** is an architect, writer, and planning consultant in Michigan with a special focus on sustainable and universal design and rainwater collection systems. [www.celesteallenovakarchitect.com](http://www.celesteallenovakarchitect.com)

**THERMOCROMEX™**  
LIMESTONE PLASTER ULTRA-HIGH-PERFORMANCE CLADDING

Thermocromex, the leading High Performance Limestone Plaster, is applied seamlessly achieving almost any texture, including smooth finishes. Extensive custom colors are available and comes pre-mixed for ease of installation. LEEDv4 potential 45 points in 8 categories. Its comprehensive 20-year performance warranty includes keeping out the rain, delamination, etc. [www.thermocromex.com](http://www.thermocromex.com)



All images courtesy of Metl-Span

The Hope Lake complex, pictured here in Cortland, New York, used standing seam insulated metal roofing panels as a perfect all-in-one air, vapor, water, and thermal solution to cover an indoor water amusement park with high moisture in the air.

# Insulated Metal Panels On the Roof

An all-in-one building enclosure solution

Sponsored by Metl-Span

**A**s an all-in-one air, vapor, and water barrier with continuous thermal insulation, insulated metal panels (IMPs) for roofing are an ideal way to meet today's increasingly stringent building codes.

The prefabricated units, when installed correctly, can contribute significantly to the building enclosure's thermal performance levels, while simultaneously enabling fast-tracked construction and lower field labor costs.

Made from rigid foam injected into two sheets of metal, Phil Kazba, FCSI, CCS, AIA, SpecGuy Specifications Consultants, Mount Dora, Florida, describes IMP roof and wall systems as providing the closest-to-perfect solution for uniform temperature, moisture, air, and water vapor control.

Originally developed for large industrial facilities requiring space conditioning, growing interest in continuous insulation performance, partially driven by the codes, has helped propel IMPs into the architectural realm, making it a suitable choice for arenas, schools, office buildings, fire stations, transportation hubs, and airport facilities.

"The panels are relatively lightweight, installation and erection is relatively fast, and the panels function as a structural deck, insulation, and finish system all-in-one package that can span over supports/purlins," reports Richard S. Koziol, AIA, NCARB, principal, Wiss, Janney, Elstner Associates Inc., Northbrook, Illinois.

The Windy City architect also sees IMP roofing systems as best suited for steel-frame build-

## CONTINUING EDUCATION



1 AIA LU/HSW



1 GBCI CE HOUR

### Learning Objectives

After reading this article, you should be able to:

1. Describe the advantages of insulated metal roofing panels for roofing as an all-in-one air, vapor, and water barrier solution, along with the continuous insulation requirements mandated by many codes.
2. Compare the benefits of IMP roofing to common roofing alternatives.
3. Identify the growing importance of a high-performing building enclosure and how IMPs support this goal.
4. Discuss a number of best practices for the optimized design and installation of IMP roofing systems.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

AIA COURSE #K1609C  
GBCI COURSE #0920010022



ings having a minimum roof pitch of 1:12 and steeper, and for roof geometries that are simple and straightforward.

“One of the most apparent advantages of the IMPs over other roofing methods is the significant reduction in installation steps and trades responsible for installation of the roof,” states Todd Wolf, principal, building science specialist, BCRA Nexus, Tacoma, Washington. “In certain climates and environments, this reduction also translates into less exposure of other building components to the elements, with a faster dry-in period and less sensitivity to the weather conditions during installation.”

And because the panels are attached by a simple pre-engineered combination of clips, fasteners, and substrate, they are not subject to failures resulting in incompatibility amongst components, moisture within the system, application temperatures, or similar failure modes present in membrane roofing, according to Kazba.

“Virtually maintenance-free, IMPs are subject to very occasional inspection to verify substrate movement or improper fastening have not led to joint or flashing displacement,” he adds.

### EVALUATING ALTERNATIVES

In comparing IMPs to other roofing alternatives—namely built-up roof membranes, EPDM (ethylene propylene diene terpolymer) rubber roofing, and modified bitumen (modbit)—IMPs offer a number of advantages.

For starters, the above-mentioned roofing materials either have an adhesive or the plys must be touch applied, thereby creating an

unpleasant odor, which can be disruptive when retrofitting an existing operating building.

Even more serious, torch-applied modbit is known to cause leaking and moisture infiltration in cases where the moisture barrier is improperly installed, says Sam Williamson, co-founder, KBHomeSpecialists, Glasgow, Scotland.

“In the case of EPDM, the main issue is it is still a relatively recent innovation, and finding workers who are skilled enough to install the system correctly can be difficult,” he explains. “On the contrary, IMPs can be installed very easily and are far more resilient than rubber EPDM.”

While built-up systems offer a high level of waterproofing, they come along with higher installation costs, a slower installation schedule, and are more susceptible to wind and water damage.

Of course, another significant factor is a noted difference in life expectancy. Whereas built-up, modbit and EPDM will last between 15 and 20 years, metal roofing offers more than 40 years with little maintenance. Once modbit and EPDM start to fail, the insulation begins absorbing moisture, at which point the materials have little to no insulation value.

In fact, IMPs really stand out when it comes to insulation, lending higher R-values per inch, as compared to the alternatives. Take a standard thermal transmission test, at an average 75 degrees Fahrenheit, for example. The R-value of a 2-inch IMP clocks in at 14.28, at 4 inches the R-value is 28.6, and a 6-inch IMP has an R-value of 42.9. To compare, a 3.5-inch layer of fiberglass insulation registers an R-value of 11, and 6 inches offers an R-value of 19.

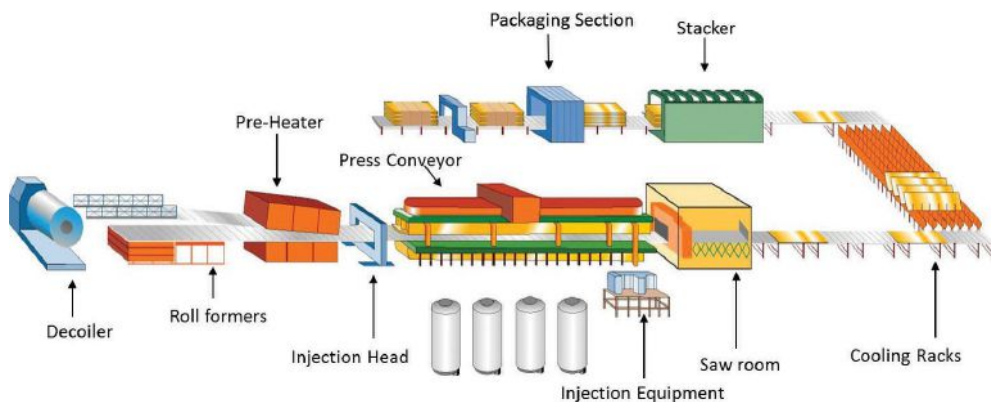
Another disadvantage with fiberglass is the R-value becomes compromised when compressed. This inconsistency in the fiberglass thickness, coupled with an added requirement for manual labor to secure it to the frame, leaves a noted margin of error. Furthermore, fiberglass insulation has a facing on the interior side, which is vulnerable to damage when exposed to a building’s interior.

Conversely, IMPs have an advanced polyurethane core sandwiched between two metal skins, capable of delivering a consistent, long-term R-value. When properly installed and sealed, the insulation becomes encapsulated by metal trim, effectively creating an impermeable membrane around the panel.

### THE BUILDING ENCLOSURE

When considering an IMP roof, an important factor is the fact that it is capable of supporting a high-performing building enclosure, which has evolved into a sought-after building feature in recent years.

“The amount of energy, and consequently heat, that is lost through poorly insulated roof and walls is staggering. Building owners have



**By injecting a polyurethane core into two metal facings, the insulation is encapsulated by metal trim, which creates an impermeable membrane around the panel, thereby protecting the insulation.**

no problem getting heat into their facilities, but keeping it there is another matter entirely,” notes Williamson.

Consequently, “a thermally efficient, well-sealed enclosure is paramount to a building’s overall energy efficiency,” states Richard Keleher, AIA, CSI, LEED AP, senior architect, The Thompson & Lichtner Company, Canton, Massachusetts. “In fact, it is the first thing that should be done when planning for energy efficiency.”

Offering energy savings between 20 percent and 40 percent, particularly in climates with extreme cold or heat, properly sealing the envelope has become a big focus for today’s buildings.

Recognizing the criticality of the building enclosure, the U.S. Army Corps of Engineers actually requires its buildings to undergo whole building air leakage testing, in addition to meeting ASHRAE’s 90.1 standard for a tight building enclosure. While somewhat less aggressive, the International Energy Conservation Code (IECC) has also jumped on the bandwagon, requiring air tightness levels at 25 percent less than ASHRAE 90.1. Based upon the U.S. Department of Energy’s latest Status of Energy Code Adoption map earlier this year, 25 states have adopted some form of the 2012/2015 IECC air leakage standard, which permits air leakage compliance through either the air tightness of the individual components or through the continuity of the entire air barrier assembly, as verified through a whole building air leakage test.

“When performing a whole building test, both the components, and more importantly, the continuity of transitions between components and materials, is of paramount importance,” relates Wolf. “The IMPs our firm has tested have an advantage over other building components and assemblies during a whole building air leakage test in that the metal on the panels is an excellent air barrier material, and the panel assemblies are frequently designed and fabricated to interlock in a tongue-and-groove method with sealant along all of the groove edges.”

“When the panels are properly installed with continuous seals at panel joints and proper roof-to-wall transitions, the effective air leakage rate is reduced to near ASHRAE’s tight building standard of 0.10cfm/sf of air leakage at a pressure differential of 75 Pa,” he adds.

A key detail for achieving a thermally efficient building enclosure is having the insulation on a continuous plane with minimal joints and seams to prevent thermal bridges where insulation can escape, explains Koziol. Because IMP roof systems typically have a single-layer plane of insulation with a sealed side and end joints or laps for moisture resistance, as well as thermal efficiency, they are a very good option for energy savings.

Putting things into perspective, IMPs offer close to three times the insulation efficiency as a field assembled glass fiber system, according



To achieve proper air and water infiltration for the IMP system, a proper seal system is critical.

to the Glenview, Illinois-based Metal Construction Association (MCA). As delineated in MCA’s *Selection Guide for Insulated Metal Panels* (available as a free download at [www.metalconstruction.org/download.php/education/downloads/user\\_file\\_5](http://www.metalconstruction.org/download.php/education/downloads/user_file_5)), to achieve an R-value of 20 with an IMP, only a 2¾-inch to 3-inch thickness is required, whereas the same R-20 with glass fiber—along with a separate liner, sub girt, and fascia—will require an approximate 7½-inch-thick roof or wall system.

The guide also points out that IMP thermal performance is enhanced because there is no metal conductance from exterior to interior skin.

“The materials used on the roof have a huge impact on how energy efficient it is, and IMPs are easily one of the best choices,” confirms Williamson.

Of course, this is assuming the IMP system is properly detailed and installed. Along these lines, penetrations through the roof should be kept to a minimum because flashing them for long-term durability and water tightness can be challenging, according to Koziol.

Besides compromising energy efficiency, Jim Halle, exterior envelope superintendent, Gilbane Building Company, Albany, New York, points out that without a complete thermally efficient building envelope, the building will not function correctly. “The external elements will cause water infiltration and condensation within the building. This will cause deterioration of

interior materials, mold, and insect infestation, preventing the building from being commissioned correctly.”

Of course, the key to certifying a high-performance enclosure is ensuring that the air, water, vapor, and thermal systems are all in place, which is where the major benefits of IMPs really shine with their all-in-one solution.

In terms of better understanding how all these components work within the IMP membrane, Joseph Lstiburek, Ph.D., P.E., principal, Building Science Corporation, Westford, Massachusetts, explains that a typical IMP roof provides air, water, and vapor control above the thermal control layer, which prevents rain, air, and vapor from entering into the assembly from the outside. A membrane below the insulation keeps the air and vapor from penetrating the assembly from the inside. This approach works in all climate zones and in all interior environments.

However, for this to all work properly, there must be continuity between the walls, roofs, and slabs, which means that the roof to wall—and wall to foundation, for that matter—must connect to the control, air, vapor, and thermal layers.

Lstiburek also notes that prefabricated IMP roofs contain the same control layers as site-built roofing systems. This includes the exterior surface controlling water, air, and vapor; the interior surface controlling air and vapor; and drying occurring to both the exterior and interior.

## THERMAL PERFORMANCE AND CODE COMPLIANCE

Detailing and air barriers aside, an important aspect of IMP specifications is understanding how its thermal performance characteristics factor into building code compliance.

For starters, insulation requirements are consistently increasing over the past few code cycles. For example, the 2006 IECC's prescriptive insulation requirements for metal building roofs in ASHRAE 90.1's Climate Zone 5 include one layer of faced R-19, 6-inch fiberglass batt insulation, draped over purlins, with R-5 thermal blocks at each purlin. The 2009 IECC requires two layers of faced R-13, 4-inch fiberglass batt insulation—for a total of 8 inches in insulation thickness—draped over purlins, with R-5 thermal blocks at each purlin. And the 2012 IECC mandates the same requirements as the 2009 IECC, plus one layer of R-11, 3½-inch fiberglass batt liner system, installed between purlins, for a total insulation thickness of 9½ inches, plus thermal blocks.

As a result, continuous insulation—defined as insulation that is continuous across all structural members without thermal bridges, other than fasteners and service openings—is a growing priority with building enclosures.

Offering both continuous insulation and better “material-to-assembly” performance than other systems, when all is said and done, IMPs are a strong option for meeting code compliance.

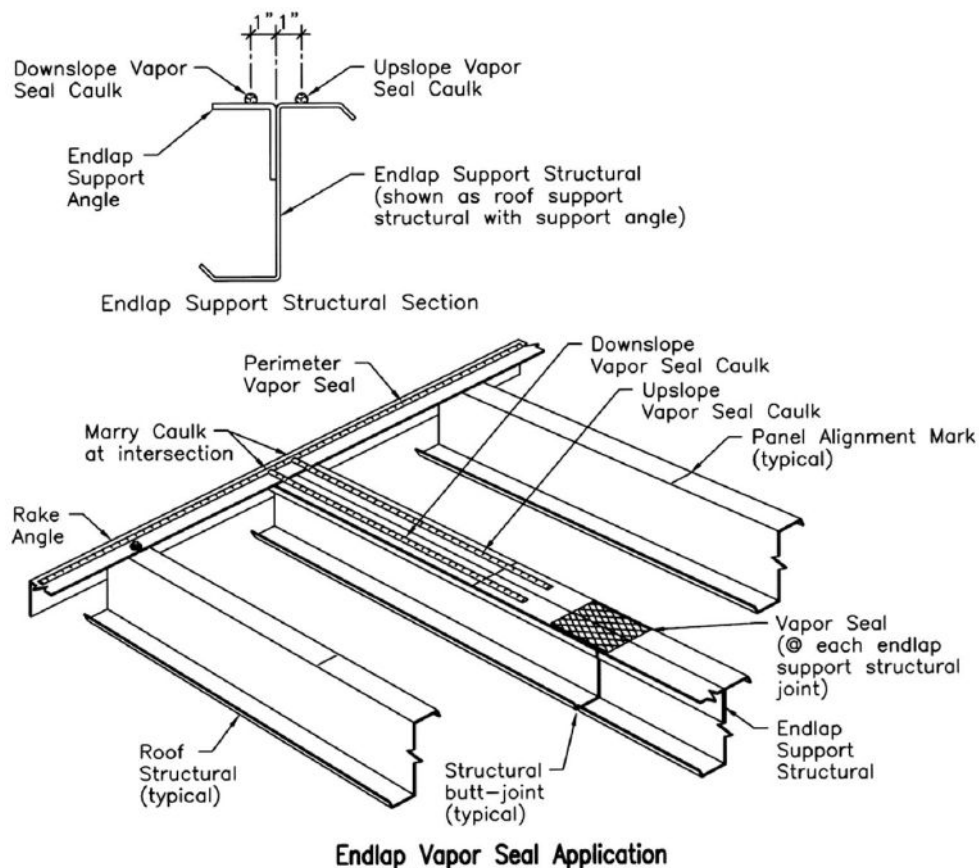
Helping to promote strong thermal performance is the fact that IMPs are designed to minimize thermal bridging. In particular, the panel faces are separated by a thermal control layer, and the panel mounting clips are attached over the thermal control layer.

Returning to the issue of conforming with the latest building codes, a number of avenues are available to designers, including prescriptive, envelope trade-off, and energy cost budget compliance options.

Starting with the prescriptive approach, where the R/U-values of the components and assemblies are submitted based upon ASHRAE 90.1 tables, IMPs deliver better U-values than most other materials. With single-source responsibility for both the thermal and weather envelope, and the fact that multiple layers of insulation/cavity-filled roofs are not necessary to achieve required insulating values, consequently saves time and money.

## CFR ROOF PANEL

450.618



The proper allocation of vapor barrier sealant is essential for a proper endlap installation.

For the envelope trade-off option, which permits envelope components/assemblies below code requirements—as long as they are offset by other above-code components/assemblies—IMPs' exceptional U-values offer the opportunity to “save” on other lower-rated envelope components, such as windows or doors. This also presents greater design flexibility, as specifiers are not locked into certain products or assemblies.

As for the third energy cost budget approach, which allows use of any components/assemblies—as long as the building uses less energy than the prescriptive solution—this supports tradeoffs between envelope and other systems. With the use of IMPs, a high-performing envelope gives more

flexibility with the energy consumption levels expected of other building systems.

It's important to note that the second and third options do require modeling to demonstrate performance-based compliance. Common software programs include eQuest, a user interface for DOE-2 software developed by U.S. Department of Energy, and Energy Plus—a newer DOE program. In terms of IMPs supporting code compliance, MCA has its own IMP technical committee currently investigating ways to directly include IMPs in future ASHRAE 90.1 standards as its own unique construction type.

Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)



Metl-Span is a dynamic industry innovator dedicated to manufacturing and marketing the highest-quality insulated building panel products. Since our origination in 1968, we have been pioneers in research, design, production, and sales of state-of-the-art insulated metal panels and building materials serving the commercial, industrial, and cold storage industries. We are a recognized leader in the advancement of insulated metal panel technology. With our history of visionary product design—and by consistently setting the highest standards in technological advances—architects, designers, and builders trust Metl-Span panel products to perform reliably, be aesthetically pleasing, and come with a proven sustainability track record. Structural integrity, tireless testing, and a determination to exceed expectations are primary to Metl-Span's focus. At Metl-Span, form meets function in the most reliable, cost- and energy-efficient manner possible. [www.metlspan.com](http://www.metlspan.com)

# 125 Years of Product Innovation and Evolution

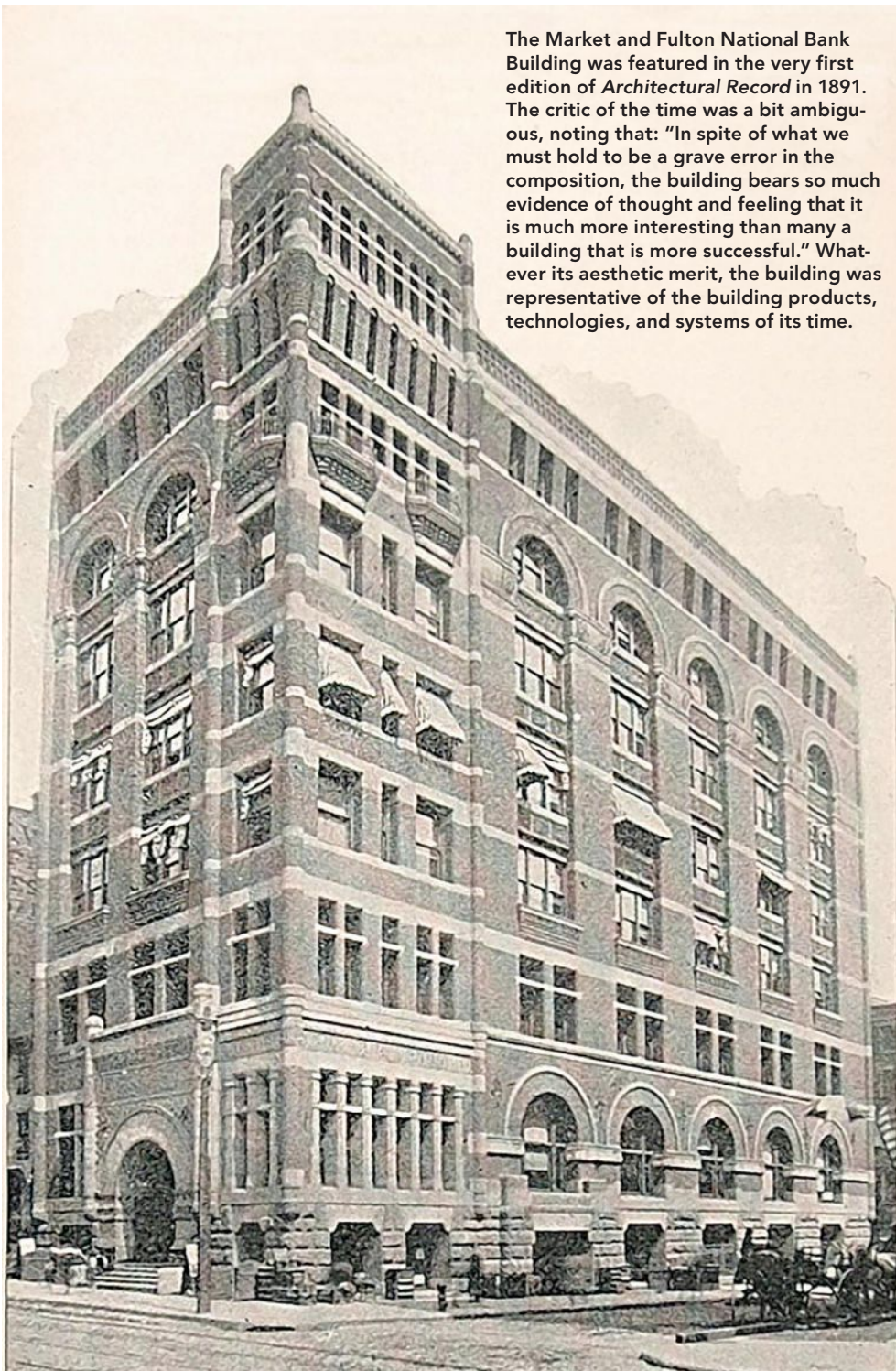
Key product and system innovations that have driven the building industry forward over the past 125 years and continue to do so

Sponsored by Armstrong® Ceiling Solutions, Excel Dryer, Inc., Guardian Glass North America, NanaWall Systems, and National Terrazzo & Mosaic Association

**T**he first issue of *Architectural Record*—then a quarterly—was published in 1891. Its goal was to provide a forum to: observe and report on trends and events in the design and construction of buildings; reflect and critique these trends; and, in the process, inform and educate architects as a means to advance the profession and practice of architecture.

The inaugural issue included a long essay on the Romanesque Revival in New York City, New York, which featured the recently completed Market and Fulton National Bank Building pictured here. The building is firmly representative of its era, incorporating the building technologies and products that were commonly available at the time. This course will briefly

The Market and Fulton National Bank Building was featured in the very first edition of *Architectural Record* in 1891. The critic of the time was a bit ambiguous, noting that: "In spite of what we must hold to be a grave error in the composition, the building bears so much evidence of thought and feeling that it is much more interesting than many a building that is more successful." Whatever its aesthetic merit, the building was representative of the building products, technologies, and systems of its time.



## CONTINUING EDUCATION



1 AIA LU/HSW

### Learning Objectives

After reading this article, you should be able to:

1. Discuss the history of the suspended ceiling and describe recent innovative products that improve occupant comfort by providing both sound absorption and sound blocking in one ceiling assembly.
2. Explain recent advances in hand-drying technology, and review new product category rules that the industry has developed to improve the verifiability and transparency of product performance evaluations for all manufacturers.
3. Define the latest innovations in high-performance glass, and explain new digital tools for comparing, optimizing, and selecting glass products.
4. Describe the health, comfort, energy, security, and durability benefits of opening glass walls, both when they are open and, equally important, when they are closed.
5. Identify the sustainability, durability, and green attributes of terrazzo, the original recycled material.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

AIA COURSE #K1609J

# NEW BLUE. NEW POSSIBILITIES.



SNX 51/23 on **CrystalBlue**

## “New Guardian CrystalBlue™

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

*Paulo Perkins, GraceHebert Architects*

SN 68 on CrystalGray

Spandrel HT

**BUILD WITH LIGHT**

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

©2016 Guardian Industries Corp.

CIRCLE 182





Photo courtesy of Armstrong® Ceiling Solutions

The centerpiece of the Westfield Santa Anita revitalization in Arcadia, California, was the sophisticated Center Court, intended to serve as a meeting place for the entire mall. The architect wanted to include an architectural element that would help bring the ceiling closer to the floor, while still allowing transparency to the clerestory windows in the existing ceiling. The solution was an elegant, custom baffle ceiling system—developed in consultation with the manufacturer—installed on each side of the Center Court.

trace the evolution of five of these technologies over the 125 years since the facility opened to the public: suspended ceilings; hand-drying systems; window glass; opening glass walls; and terrazzo. The course will look at where these technologies stood in 1891, how they have changed and developed over the intervening years, and what innovations are currently driving each market segment forward.

#### SUSPENDED CEILINGS: THEN AND NOW

As long as we've had buildings, we've had ceilings—some as simple as the underside of the floor or roof, others as elaborate as the coffered ceiling of the Pantheon, the frescoes of the Sistine Chapel, or the murals in the main reading room of the Library of Congress. And historically, once a ceiling was installed—no matter the shape, material, or decoration—it stayed in place. There was no reason to move or adjust it, and there was nothing above it that needed to be moved or adjusted either.

That all began to change in the late 1800s, when indoor plumbing, heating systems, and electricity became more common in buildings. At the turn of the century, these systems were typically run through or along walls and floors, and the ceiling remained relatively untouched. This would certainly have been the case for the Market and Fulton National Bank, which would have used plaster, mosaic, tile, or perhaps tin for its ceilings. But early in the

20<sup>th</sup> century, as these new systems continued to multiply and evolve, it became clear that a fresh approach was needed to deal with them—an approach that both concealed these systems for aesthetic reasons, and provided access to them for maintenance and repair. The suspended ceiling was born.

The first patent for a suspended ceiling was filed on May 28, 1919 for a system that was built using interlocking tiles. The only way to access the plenum space above these tiles—where many of the new systems were now housed—was to start at one edge of the ceiling, or at a designated “key tile,” and then remove adjacent tiles, one at a time, until the desired place to access the plenum was reached. In spite of the time and cost of this approach, it remained the dominant suspended ceiling system for close to 40 years with expanded performance attributes, such as sound control and fire resistance. In 1958, the patent for an accessible suspended ceiling was filed. The new system allowed access to the plenum from any point and, with many variations and updates, remains the system we use today.

The new system worked well. It was inexpensive to install and maintain, provided ready access to the plenum and endless flexibility for reconfiguring the space below, and suited the sleek, modern look favored by mid-century architects. That's why we still see so many suspended ceilings today. But changing aesthetic aspira-

tions, combined with increasingly challenging performance requirements, have been driving significant innovation across the ceiling industry in recent years. The monolithic look is still highly popular, and has been expanded through an evolution of innovative installation and configuration choices from staggered panels to completely concealed suspension systems that still allow access to the ceiling plenum and provide architects with virtually limitless options for reimagining the “fifth wall” of a space.

At the same time, ceiling systems are now capable of integrating a range of additional components and systems—from light fixtures to data management systems to trim and transition products—that make it easier to specify complete ceiling solutions that can offer an integrated visual and save a project time and money. Parallel to these developments, there has also been rapid change in the performance characteristics of ceiling systems, especially in the realms of both acoustics and sustainability. The net result is a new era for the suspended ceiling, almost 100 hundred years after the first patent was filed.

#### HAND DRYERS: THEN AND NOW

The first patent for perforated roll toilet paper was filed in 1891, but the hand-drying technology used in the Market and Fulton National Bank building was undoubtedly cloth towels, the sanitation method of choice for several preceding





A floor that will last a lifetime should be installed by someone with a lifetime of experience – your NTMA contractor.



National Terrazzo & Mosaic Association  
[www.NTMA.com](http://www.NTMA.com)  
800.323.9736

CIRCLE 186

Photo courtesy of Excel Dryer, Inc.



**The latest advancement in restroom design: the integrated sink system that combines on one sink deck all of the green elements of high-speed, energy-efficient dryers and touch-free soap dispensers with the water-saving capacity of sensor-activated, low-flow faucets to create the next generation in green restroom design.**

decades. That all changed with the introduction of paper towels in 1907, which gradually took over from cloth and became the dominant hand-drying technology in restrooms across the country—a technology that remains in widespread use today.

Electric hand dryers have a shorter but, in many ways, more dynamic history. The earliest patent was filed in 1921 for an invention that “...relates to improvements in drying apparatus and has for its object to provide a simple and efficient apparatus for delivering a blast of heated air for drying the face, hands, or hair of a person, or for drying jewelry, metal parts, glassware, or other articles.” The dryers that were manufactured based on this patent were called “electric towels” and were used in restrooms, barbershops, and factories across the country. They also established the “heated air” technology used by a range of hand-drying companies that emerged over the ensuing decades. While innovative at the time, this approach was noisy and inefficient, taking up to a minute to dry hands and wasting energy in the process. But it would still take more than 70 years for the next big breakthrough in hand dryers to occur: in 2001 when an American company introduced high-speed jets of air that blow water off of hands rather than just evaporating it.

This innovation swept the industry, driving continuous improvements in both features and

performance such that today’s most advanced hand dryers are not only exponentially faster than their predecessors, they also include a wide range of features that provide far greater design flexibility: sensor-activated, touchless controls; adjustable speed and sound; HEPA filtration systems;

adjustable heat settings; and multi-voltage options. These dryers are also far more energy efficient and environmentally responsible, with at least one leading manufacturer going so far as to develop full life-cycle assessments for its products following ISO 14040 standards.

While many of the elements circa restrooms in 1891 are still familiar today, the way we dry our hands is radically different—and the industry that has driven these changes continues to innovate, pushing restroom design and performance in exciting new directions, including fully integrated sink systems with soap, faucet, and dryer all mounted on the sink deck that are just now being introduced to the market.

### GLASS AND GLAZING: THEN AND NOW

Although glass artifacts from more than 5,000 years ago have been found in Egypt, the Romans appear to be the first to have used glass for windows, perhaps as early as the 1<sup>st</sup> century CE. These early windows were small, irregularly made, and not very transparent. They were probably manufactured by blowing an elongated balloon of molten glass and cutting off the ends to create a glass cylinder that was then split and flattened to create what has subsequently been referred to as “broadsheet” glass. Like many technologies from the Roman era, manufacturing glass for windows declined during the Dark Ages, but began to pick up again in the early 14<sup>th</sup> century, when a new technique for making glass was introduced by French glass makers. “Crown” glass, as the new material was called, was also made by blowing molten glass, but this time into a sphere rather than a cylinder.


Image courtesy of Guardian Glass North America


## Appearance Comparison


[← Back to Glass Visualizer](#)


### Choose a Sky Condition


Sky conditions can dramatically affect the visual appearance of the glass.

  
Full Daylight

  
Cloudy Day


  
Clear Sunrise


  
Cloudy Sunset

  
Clear Night

### Choose a View

Choose an interior or exterior point of view in which to simulate your project.

  
View from Exterior

  
View from Interior

Visualization tools, like the one pictured here, represent a significant advancement in helping architects select glass products, allowing designers to virtually “see” and compare the aesthetic properties of glass through photo-realistic images of both exterior and interior applications.



“Manufacturers make outrageous claims every day. It’s greenwashing at its worst. Not Excel Dryer. They set the bar for transparency and sustainability.”



**PENNY BONDA** | [eco] impact Consulting, FASID, LEED FELLOW

Penny Bonda is known as the “mother of green interiors.” She is a pioneer in the industry with extensive expertise in environmental design and international sustainability practices. Excel Dryer is proud to partner with Penny and [eco] impact on an updated Next Generation Green Restroom Design CEU course designed to help architects specify the most cost-effective, hygienic and environmentally friendly restroom with today’s latest technology.

**NEW AIA CEU - Contact Us Today to Schedule a Lunch and Learn!**



**TIME TO THROW IN THE TOWEL®**

CIRCLE 92

888.550.2254  
exceldryer.com  
sales@exceldryer.com



Photo courtesy of NanaWall Systems



The owners of this 25-year-old restaurant in Dallas, Texas, wanted to increase seating capacity inside and out. The architect, Dallas-based MSC Design, decided to include a folding glass wall as part of its overall plan for the space. This particular system was appealing because it offered 12-foot-high panels that let in plenty of daylight and because it allowed the floor track to carry the system's weight, relieving stress on the header, which had not been engineered to carry such a load.

The end of the sphere opposite the blowing pipe was then cut off while still molten and spun into a circular sheet of glass. Roughly the size and shape of a bottle base today, these small pieces of glass were typically installed in lattice frameworks made out of lead. Crown and broadsheet remained the dominant forms of glass making until polished plate glass—produced by a casting process, rather than by blowing—was introduced in the late 18<sup>th</sup> century. Then, in 1834, a new, advanced cylinder sheet process for making broadsheet glass was introduced, allowing much larger sheets to be produced. This, combined with significant drops in the overall cost of glass for windows, made this new method the dominant technology for manufacturing glass for the remainder of the 19<sup>th</sup> century—and it was probably the method used to create the single-pane, double-hung windows in the Market and Fulton National Bank Building.

In the intervening years, innovation in glass production and performance have taken off. The most consequential advance in manufacturing came in the late 1950s with the introduction of “float” glass, which is

produced by floating glass on a bed of molten tin. This new process allowed glass to be continuously produced without any blowing, and was able to take full advantage of the automation and mass-production techniques sweeping through industries across the world at the time. The result was widespread availability of window glass in a range of sizes at affordable prices, and an explosion in the use of glass in buildings. This, in turn, drove a burst of innovation in glass features and performance that continues today: monolithic glass using body tints to control energy were first introduced in the 1950s. During the energy crisis of the 1970s, glazing really started to focus on how to become more energy efficient. The first coatings started with a reflective aesthetic in the 1960s, then evolved in the late 1980s to vacuum deposition coatings called soft coats. These coatings allowed for more visible light and an expanded color palate, as well as improved energy efficiency. Since then, vacuum deposition coatings have continuously improved to meet modern design goals. The glass industry continues to innovate with new technologies like dynamic glazing.

With such a wide and constantly growing range of glazing options available to architects, a key 21<sup>st</sup> century innovation has been the creation of digital tools that can help designers evaluate and select the precise glass product they want quickly, easily, and accurately. These tools now exist, allowing architects to: customize the performance properties they desire; visualize the glass they want from a variety of perspectives in a variety of weather conditions; evaluate and compare glass performance (light transmission, u-value, solar heat gain coefficient) for a variety of alternatives; calculate energy performance; and export the results to a BIM model. All within a seamless process designed to save architects time, while also giving them the flexibility to explore a wide range of glazing options and alternatives, some of which they may not have considered before.

#### GLASS WALLS: THEN AND NOW

In 1891, exterior walls didn't move, slide, or fold, and they certainly weren't made of glass. A few experimental glass wall examples had been constructed in England (Oriental Chambers in 1864 and 16 Cook Street in 1866), but they

# PrivaSEE—Control Sound Transparently



## The One and Only NanaWall

PrivaSEE frameless opening glass wall provides flexible space management and enhanced acoustical separation.

- Independently tested and rated to STC of 36 and OITC of 30.
- Provides better sound buffering than many fixed all glass partitions.
- All glass system with no floor track.



Get inspired.  
Visit [NanaWall.com](http://NanaWall.com)

**CIRCLE 150**

Showrooms Nationwide  
800 873 5673  
[nanawall.com](http://nanawall.com)

**NanaWall**<sup>®</sup>  
Engineering the Exceptional

were just that: experiments. And while cast iron facades—in some ways, the first curtain walls applied to nonresidential buildings—had been introduced several decades earlier, they were not in widespread use. Steel framing for larger buildings was becoming common, but it had not yet freed up the exterior wall from its role in structurally supporting the building. As a consequence, solid walls with punched openings for windows—like those in the Market and Fulton National Bank—were the norm. It would take more than 50 years for framing and glazing technologies to evolve and then combine into the glass curtain wall systems that dominate commercial building construction today; notably, with the design and construction of the Lever House building (Skidmore, Owings and Merrill) in New York City, New York, in 1952, and its many imitators and followers. But, even though today's curtain walls provide virtually limitless design potential matched with a wide range of high-performance characteristics, they still remain fixed in place, even when parts of the glazing might be able to open and close.

Parallel to the development of the glass curtain wall, two other technologies also took off in the 1950s in terms of popularity and use: folding interior partitions for commercial and institutional buildings, and sliding glass doors for residential applications. Both involved the development of new materials for panels and frames. Perhaps even more important, both also involved significant innovation in the track and hardware configurations that actually allow these panels to fold and slide—all while meeting increasingly rigorous demands in terms of durability, ease of use, acoustic and thermal performance, aesthetics, and security.

Combined, the technological and system innovations in the folding partition, sliding glass door, and curtain wall industries laid the technical and conceptual groundwork for one of the latest advances in exterior wall design and construction: walls that are made of glass but that also fold, slide, and move.

#### TERRAZZO: THEN AND NOW

Terrazzo was created in the mid-16<sup>th</sup> century when Venetian mosaic workers discovered a way to reuse marble remnants left over from their mosaic projects. With odd-size chips, they began to build terraces (“terrazze”) around



Photo courtesy of National Terrazzo & Mosaic Association

**Terrazzo provides virtually unlimited design possibilities and, at the same time, is durable enough to last as long as the building itself. This decorative floor at New Orleans' Lakefront Airport terminal, for example, was under 4 feet of water following Hurricane Katrina. Unlike other materials in the terminal that suffered significant damage, the floor needed no more than a light sanding and polish to be usable again.**

their living quarters, giving birth to a new flooring product and providing its name at the same time.

During the following centuries, the process for creating terrazzo floors remained relatively unchanged, and the craftsmen who created them remained remarkably cohesive, clustering in and around the Friuli region of Italy. The first terrazzo in the United States was laid by these Italian craftsmen in 1890—one year before the Market and Fulton National Bank was featured in *Architectural Record*—in the Vanderbilt residence in New York. But, while this was a prestigious commission, terrazzo remained a niche product until the decades following World War I, when terrazzo became a flooring of choice in the United States, overtaking and replacing the use of marble mosaics. Architects in the 1920s suddenly recognized the design potential of terrazzo for the smooth, curvilinear art deco/modern styles of the period. In addition, the invention of the electric grinder in 1924 radicalized the industry, providing a finer finish, greater speed, increased accuracy, and lowered costs, all contributing to the spread of terrazzo across the United States. During the same period,

metal divider strips were introduced, which allowed the creation of highly artistic and intricate patterns and designs in terrazzo floors, and also accommodated expansion and contraction of the surface to help minimize cracking.

The next evolution within the industry occurred in the 1970s with the introduction of polymer-based terrazzo, also referred to as “epoxy thin-set” terrazzo. This material provided a wider selection of colors, a thinner and lighter finished product, faster installation times, high impermeability and strength, and less susceptibility to cracking. Epoxy thin-set has become the norm for terrazzo today. Other systems include: sand cushion, bonded, monolithic, polyacrylate, and rustic. With much higher performance and sustainability characteristics than were possible in the past—and with its combination of beauty, durability, and low maintenance—terrazzo is now undergoing renaissance as a flooring product that provides both significant life-cycle benefits and virtually endless design flexibility.

Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)



# PRODUCT REVIEW

125 Years of Product Innovation and Evolution

## Armstrong® Ceiling Solutions

Photo courtesy of Armstrong® Ceiling Solutions



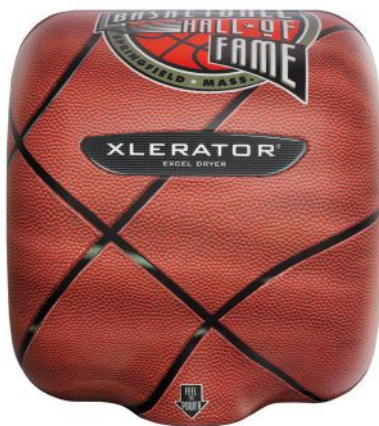
### Total Acoustics™ performance from Armstrong Ceilings

Noise can impede concentration, healing, and learning. Total Acoustics™ ceilings feature the ideal combination of both sound absorption (NRC) and sound blocking (CAC)—complete noise control and design flexibility for every space. Rated good, better, best so you can easily choose the ceiling that's right for your spaces.

[www.armstrongceilings.com/totalacoustics](http://www.armstrongceilings.com/totalacoustics) Circle 60

## Excel Dryer, Inc.

Image courtesy of Excel Dryer, Inc.



### XLERATOR® Hand Dryer: Customizing Your Hand-Drying Solution

XLERATOR® has new enhanced standard features for adjusting sound, speed, and heat. Customize even further with the most options and accessories in the industry, featuring HEPA filtration and custom covers available in any color or with digital images to design the best hand-drying solution for any restroom environment.

[www.exceldryer.com/products\\_xlerator](http://www.exceldryer.com/products_xlerator) Circle 61

## Guardian Glass North America

Image courtesy of Guardian Glass North America



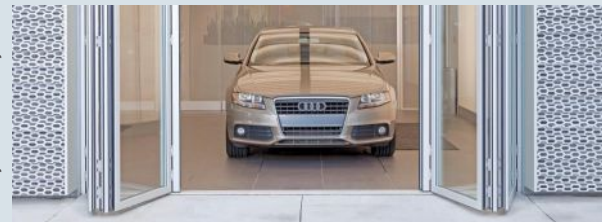
### Guardian CrystalBlue™ glass

Guardian CrystalBlue™ glass can be combined with many SunGuard® low-e products, giving architects a range of energy performances along with high visible light transmission in an in-demand, soft blue color. Crystal-Blue glass is available coated and uncoated at 6-millimeter thickness in a variety of sizes.

[www.guardianglass.com/commercial](http://www.guardianglass.com/commercial) Circle 62

## NanaWall Systems

Photo courtesy of NanaWall Systems



### NanaWall Opening Glass Walls

NanaWall Systems provides a wide range of opening glass walls for commercial environments that stand up to the daily commercial grind, as well as the challenges of wind, water, extreme temperatures, forced entry, impact, and structural load.

[www.nanawall.com](http://www.nanawall.com) Circle 63

## National Terrazzo & Mosaic Association

Photo courtesy of NTMA/Craig Thompson Photography



### Terrazzo: The Art of Craft

Terrazzo fits any design plan from elegant simplicity to complex art patterns. With an unlimited color palette, varied aggregate choices, and state-of-the-art water-jet strip cutting, terrazzo is a designer's dream. Terrazzo's antimicrobial, durable, sustainable, and easy-to-maintain surface makes it the premium choice in flooring.

[www.ntma.com](http://www.ntma.com) Circle 64



# Mind the Gap

Using sound masking in open and closed spaces

Sponsored by LogiSon Acoustic Network | By Niklas Moeller

The majority of employees spend over half their time on individual focus work and another large percentage on the telephone. Their environment should support these activities, but instead, workplace design trends are steadily eliminating many methods of controlling acoustics. While the proportion of open plan and occupant densities grow, partitions are lowered or omitted, absorptive finishes are forgone in favor of exposed surfaces, and closed rooms are built using demountable walls, reducing room-to-room isolation.

Whether such decisions are made for the sake of aesthetics, sustainability, or short-term budget goals, they all reduce acoustic performance. The situation is compounded by improvements in construction materials, mechanical, and office equipment, which have lowered the ambient—or background—sound level. The resulting ‘pin-drop’ environment allows conversations and noise to easily be heard and understood, even from a distance. What ambient sound remains does not exhibit the correct mix of frequencies needed for speech privacy, noise control, and comfort.

Sound-masking technology is used to distribute an engineered sound throughout a facility, raising its ambient level in a controlled fashion. While adding more sound to a space might seem to contradict the goal of achieving effective acoustics, the premise behind this solution is simple: it covers up noises that are lower in volume and reduces the disruptive impact of those that are higher by decreasing the magnitude of change between the baseline and any peaks in the space. Conversations are also either entirely covered or their intelligibility is reduced. Hence, occupants perceive treated spaces as quieter and more private.

Most people have experienced this type of effect—for example, when washing dishes at the kitchen sink while trying to talk to someone in the next room. The listener can tell the other person is speaking, but it is difficult to understand exactly what is being said because the running water has raised the ambient level in their area. In fact, everyday examples are virtually endless: the drone of an airplane engine, the murmur of a crowd in a busy

## CONTINUING EDUCATION



1 AIA LU/HSW



0.1 IDCEC CEU

### Learning Objectives

After reading this article, you should be able to:

1. Discuss common issues affecting the acoustic performance of closed rooms.
2. Describe the impact of background sound levels on occupant comfort and productivity within both open and closed spaces.
3. Explain sound masking's role in achieving construction savings and preserving flexibility.
4. Increase speech privacy and reduce noise disruptions in the workplace.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

AIA COURSE #K1609G  
IDCEC COURSE #CC-105614-1000



Image courtesy of NRC

restaurant, or even the rustling of leaves in the wind. They all have the potential to mask sounds the listener would otherwise hear.

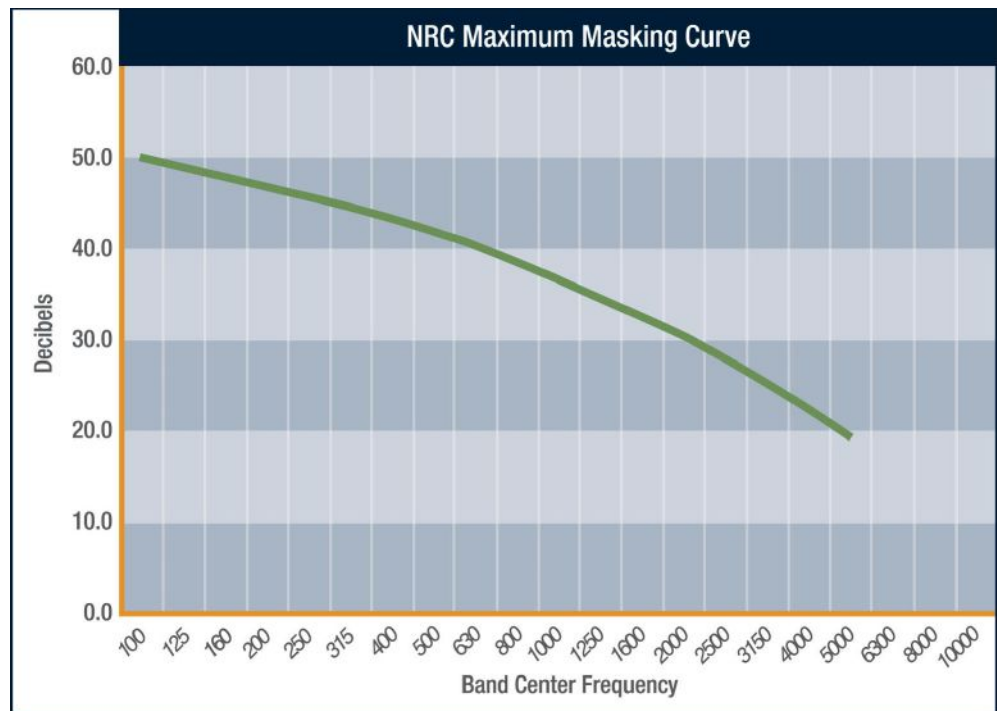
Of course, when introducing a sound to a workplace, it is vital to ensure that it is as comfortable and unobtrusive as possible. Though most compare the sound of a well-designed and professionally tuned masking system to that of softly blowing air, it actually follows a nonlinear spectrum or 'curve,' which is defined in third-octave bands and typically ranges from 100 to 5,000 hertz (Hz), or as high as 10,000 Hz. Unlike 'white noise' or 'pink noise'—terms often, but incorrectly, used in this context—this curve is specifically designed to balance acoustic control and occupant comfort. A successful implementation involves achieving both goals, in equal measure.

### MYTHS AND MISCONCEPTIONS

Over the past decade, there have been tremendous advancements in sound-masking technology, increasing performance, expanding functionality, and opening the door to new applications. Yet, certain outdated design practices persist, often to the detriment of speech privacy, noise control, and overall acoustic comfort. One such custom is the exclusion of sound masking from closed rooms, such as private offices, meeting, and audio/video conferencing rooms.

Several reasons are used to justify this type of design. The first is an historical remnant from the days when sound masking was first adopted to help with the obvious acoustic challenges encountered in an ever-growing number of open plans. This initial application led some to conclude that masking was only intended for these areas.

However, this opinion was also reinforced by a significant technical impediment. Early sound-masking systems exclusively used a centralized architecture, which is very limited in terms of its ability to offer local control over the masking sound. Large zones spanned numerous private offices and other closed rooms, with little op-



A sound-masking spectrum or 'curve,' such as the one preferred by the National Research Council (as shown), is defined in one-third octave bands and typically ranges from 100 to 5,000 hertz (Hz), or as high as 10,000 Hz.

portunity to adjust the volume within each space (i.e., only via transformer taps located on the loudspeakers) and no control over frequency. The resulting inconsistencies in volume and spectrum impacted masking performance and occupant comfort, leading both vendors and dissatisfied customers to conclude that the technology simply could not be applied in closed spaces.

Despite the fact that modern networked sound-masking architectures address these deficiencies by providing fine control over both volume and frequency within small zones (i.e., of one to three loudspeakers), some still argue that masking is best left to open plans.

Beyond its historical foundations, there are a few other reasons consistently cited for excluding closed rooms from sound-masking designs. One objection is the idea that these spaces do not require masking because they are afforded sufficient speech privacy and noise control via physical isolation. Another is the concern that sound masking will interfere with communication, either within the room itself or over audio/video conferencing equipment.

In fact, if handled properly, there are numerous advantages to including sound-masking coverage for closed rooms: greater consistency of acoustical characteristics across the facility,

higher occupant satisfaction, increased speech privacy and protection from noise disruptions, construction savings, and the preservation of flexibility for future renovations.

### WALL CONSTRUCTION

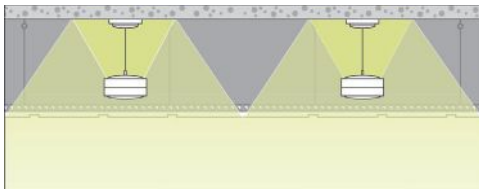
Closed offices and meeting rooms are built with the intention of providing occupants with both visual and acoustic privacy. While the first goal can easily be achieved, the latter often proves elusive because of the many ways in which sound can transfer from one space to another.

In the attempt to create sufficient speech privacy, one might specify walls with high sound transmission class (STC) ratings. However, STC ratings are lab tested and frequently overstate real-world performance by 5 to 10, or more, points. Site-tested field STC or noise isolation class ratings are better gauges, but unfortunately, only testable after the fact.

Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)

*Niklas Moeller is vice president of KR Moeller Associates Ltd., manufacturer of the LogiSon Acoustic Network. He has more than 25 years of experience in the sound-masking field.*

Image courtesy of Screen Solutions UK



Sound-masking technology consists of a series of loudspeakers, which are usually installed in a grid-like pattern within the ceiling space, as well as a method of controlling their zoning and output.



Today's interiors are even more dependent on sound masking for speech privacy and noise control. The LogiSon Acoustic Network is tuned using TARGET, an application that accurately adjusts each small zone to the specified spectrum, maximizing benefits and occupant comfort. Worldwide distributors provide turnkey services and support. [www.logison.com](http://www.logison.com)

All images courtesy of Icynene, except as noted



Buildings of all shapes and sizes require exterior enclosures that provide air, water, moisture, and thermal barriers. Spray foam insulation can be used to provide all of these in addition to great thermal insulation properties.

# Moisture Control with Spray Foam Insulation

How a single product can provide multiple barriers in one step

Sponsored by Icynene | By Peter J. Arsenault, FAIA, NCARB, LEED AP

**T**he design of building enclosures entails some very particular requirements that mandate attention to detail. Specifically, barriers of multiple types are needed to restrict air, water, vapor, and thermal transfer. This usually means that a wall assembly requires multiple products to address each one. An emerging alternative is to use a single product with multiple properties, thus eliminating construction steps and reducing labor and material costs accordingly. To work fully, that means the

product or material has to demonstrate proven abilities to resist heat, water, and air movement through it in addition to providing a truly continuous installation in order to assure uninterrupted performance. Such a product exists in spray foam insulation systems that have been tested and proven to provide the multiple levels of protection needed in a single-product application. At the same time, it can allow more design freedom due to the custom, field-applied nature of the system. Hence, it is becoming a popular

## CONTINUING EDUCATION



1 AIA LU/HSW



1 GBCI CE HOUR

### Learning Objectives

After reading this article, you should be able to:

1. Investigate the use of spray foam insulation to achieve multiple performance traits in one product, including thermal, air, and water resistance, while safeguarding indoor environmental quality, building safety, and health.
2. Identify the characteristics of high-performance continuously insulated exterior wall assemblies related to green and sustainable design and construction.
3. Explore how the performance characteristics of spray foam insulation can improve sustainability by controlling and preventing moisture issues from occurring in exterior walls.
4. Assess the ability of spray foam insulation to be installed with fewer steps and at a lesser cost than assemblies using rigid foam board insulation.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

AIA COURSE #K1609E  
GBCI COURSE #0920010244

alternative among architects compared to a reliance on multiple, separate barrier products for air, water, vapor, and thermal transfer.

### OVERVIEW OF SPRAY FOAM INSULATION

Spray foam insulation products have been successfully used in buildings for decades. Part of their appeal is that in addition to providing excellent thermal insulation capabilities, they can also provide a protective barrier that significantly reduces air leakage, minimizes airborne moisture transfer, and reduces bulk water transport. Since it is sprayed in place, almost monolithically, there are no seams or joints, thus creating a truly continuous layer in roof, floor, and wall assemblies. This continuity can be maintained particularly well in exterior wall continuous insulation designs, where the spray foam can be applied to the outside face of exterior sheathing, not just between the studs. These performance characteristics can not only satisfy building code requirements for weather-resistant barriers, they can also optimize energy efficiency by fully restricting heat flow and air leakage. From a design standpoint, spray foam insulation allows for plenty of architectural options. Unlike rigid board insulation products, it can be sprayed in place to conform completely against virtually any building geometry or shape, including curved and rounded forms.

### Common Types of Spray Foam

Typically, spray foam insulation is polyurethane based and referred to as spray polyurethane foam (SPF). As a manufactured product, it can be formulated in different types and in different densities, producing correspondingly different characteristics. For buildings, it is usually classified as one of the following:

- **Low-density foam** weighs around 0.5 pounds per cubic foot (0.4–0.75 available) when installed. It is typically an open-cell product, which remains somewhat flexible in place and achieves R-values comparable to fibrous insulation on the order of R-3.7 per inch or so. Low-density spray foam is fairly vapor permeable and typically does not qualify as a water barrier. Further, low-density foam can only be used in interior applications, such as filling stud or joist cavities, not for exterior continuous insulation.
- **Medium-density foam**, as the name implies, is heavier and more rigid than low-density spray foam, coming in at about 2 pounds per cubic foot, or roughly four times heavier than low-density material. Its other defining characteristic is the closed-cell nature of the insulation when mixed. Since it becomes a series of small bubbles (cells) of trapped insulating gas (a blowing agent), the thermal performance is directly enhanced, resulting in a noticeable increase in R-value up to R-7.1



Medium-density, closed-cell spray foam insulation can be applied very precisely in a controlled manner to create a very predictable surface behind cladding.

per inch. The makeup of medium-density spray foam also allows it to serve as a full air barrier, according to the Air Barrier Association of America (ABAA). Further, in terms of water vapor permeance, it tests and qualifies as a weather- and water-resistant barrier since very little water vapor passes through it.

Based on the differences between these two types of spray foam, it is clear that medium-density spray foam insulations offer the superior water- and moisture-barrier characteristics, the ability to be used as exterior continuous insulation, and much better thermal performance per inch of thickness. Collectively, this means that medium-density, closed-cell spray foam insulation provides the performance of four products in one: insulation, air barrier, vapor retarder, and water-resistive barrier. This combination of traits means it has the potential to save time and money during construction by eliminating the number of products installed or avoiding the need to cut and fit board-type insulation. Once the building is occupied, it also significantly reduces air leakage, minimizes water and moisture transfer, and optimizes energy efficiency.

### Spray Foam in Exterior Walls

All of these attributes make medium-density, closed-cell insulation suitable for many portions of the building enclosure. However, it is in exterior wall assemblies that it has become particularly popular. When used as continuous insulation over wall sheathing, it not only provides a superior insulation installation, it helps enhance the rest of the wall assembly as well. First, it should be noted that expanding

spray foams or low-density foams create the irregular and bulbous forms that many people associate with spray foam insulation. However, medium-density foam is different in that it can be installed fairly precisely and in very controllable thicknesses. That means it creates a smooth and predictable surface that is ready to receive cladding over it.

Installing spray foam insulation is much simpler than installing rigid foam boards, which require fasteners, cutting, and waste. Spray foam has its own adhesive properties that keep it securely attached in place once applied and avoid waste. Of course, not all buildings are designed to be rectilinear, and even those that are often have some unique or irregular conditions along the walls. Rigid insulation boards are necessarily rectilinear and don't bend or adapt easily to irregular conditions in a wall assembly. Therefore, they may not be a practical or realistic choice for certain buildings. By contrast, spray foam insulation conforms directly to the surface it is being applied to regardless of shape, geometry, or irregularities. That means that it fully covers and seals over the underlying construction to provide a truly continuous, uninterrupted insulation layer and protective barrier. It also means that buildings designed with intentional curves, domes, arches, angles, or other non-rectilinear shapes no longer need to suffer from lower performance because of limitations from other insulation types. For example, a curved surface would be very difficult if not impossible to cover properly with rigid foam board insulation. Mineral fiber batts or blankets do curve and may be used in wall cavities, including curved surfaces. However, they

do not provide the same performance in terms of insulation level per inch, water resistance, or air resistance. Spray foam insulation provides excellent performance in all of those areas since its characteristics are not limited or influenced by the shape of the building.

### Wall Assembly Integration

Of course, the method of securing and attaching cladding material needs to be acknowledged. Connectors or anchors for attaching cladding, whether for thin systems such as metal or fiber cement or thicker systems such as ties for brick and masonry, can be a factor in the wall assembly. Rigid foam boards are commonly available in 2-foot widths for the purpose of fitting above and below, such connectors or anchors that are spaced 2 feet apart vertically. Often, that means that there can be a horizontal gap along the joints of the foam boards, which compromises the full insulating performance of the system. This can be exacerbated if there are unusual details or irregular shapes along the wall, which alter the spacing of the cladding connectors and result in imprecise field cutting of the insulation. Spray foam insulation, on the other hand, covers and seals around all connectors and attachments completely. There is also greater flexibility with regard to attachment placement and configuration since a slightly bent or misaligned anchor can still be sprayed around without requiring realignment. This all minimizes the disruption in the continuity of the insulation, reducing it to only the actual thickness of the attachment materials.

Overall, medium-density spray foam covers the wall construction completely and creates a much more uniform layer of continuous insulation and barrier against air and weather. In the process, it seals completely around cladding attachments as well as covers over all of the joints and seams of substrates, such as exterior gypsum board. When applied around windows and doors, it makes smooth, continuous, and well-sealed transitions at heads, sills, and jambs, while conforming to flashings and other transition membrane components. If the walls have curved or other non-rectilinear shapes, the on-site spray application is ideal in that it can conform to any shape or feature of the wall system. Finally, manufacturers have recognized the need to demonstrate fire resistance and have successfully tested medium-density, closed-cell insulation in wall assemblies as part of showing code compliance for fire ratings.

### THERMAL RESISTANCE

Spray foam products are most commonly known for their insulating properties, which is appropriate since they provide an excellent solution for insulating buildings thoroughly and completely. In buildings that use framed exterior walls constructed of either metal or wood studs, it is

common to think in terms of insulating between the studs. But each of those studs is a break in the insulation that collectively can reduce the thermal performance of the wall by 20, 30, or even 50 percent. This is because the studs and other elements no longer have the thermal resistance of the insulation but instead act as a thermal bridge, allowing heat to flow more freely between inside and outside. Add in the thermal bridges that occur along floor lines or around major structural elements, such as columns, beams, piers, etc., and it is clear that a truly energy-efficient building needs a different approach to insulation.

Based on the above, the principle of continuous insulation in the building enclosure has been adopted in building codes, voluntary standards, and best practices. In exterior wall systems, that typically means a layer of exterior continuous insulation is installed outside of the exterior wall sheathing such that it covers over the outer surface of everything behind that sheathing too—the studs, the floors, the structure, etc. This dramatically increases the effective thermal performance of a wall since all or most thermal bridging is eliminated. Furthermore, the temperature of the framed wall and structure can approach the temperature of the living space if the right amount (thickness) of continuous insulation is used. That means that during cold outdoor conditions, most or all of the wall will

be not only warm, but more likely to remain dry since condensation will not likely occur. During hot outdoor conditions, a majority of the wall will be dry and cool. Such environmental conditions translate into a wall under less long-term temperature and moisture stress, which leads to greater more durability and longevity of the wall.

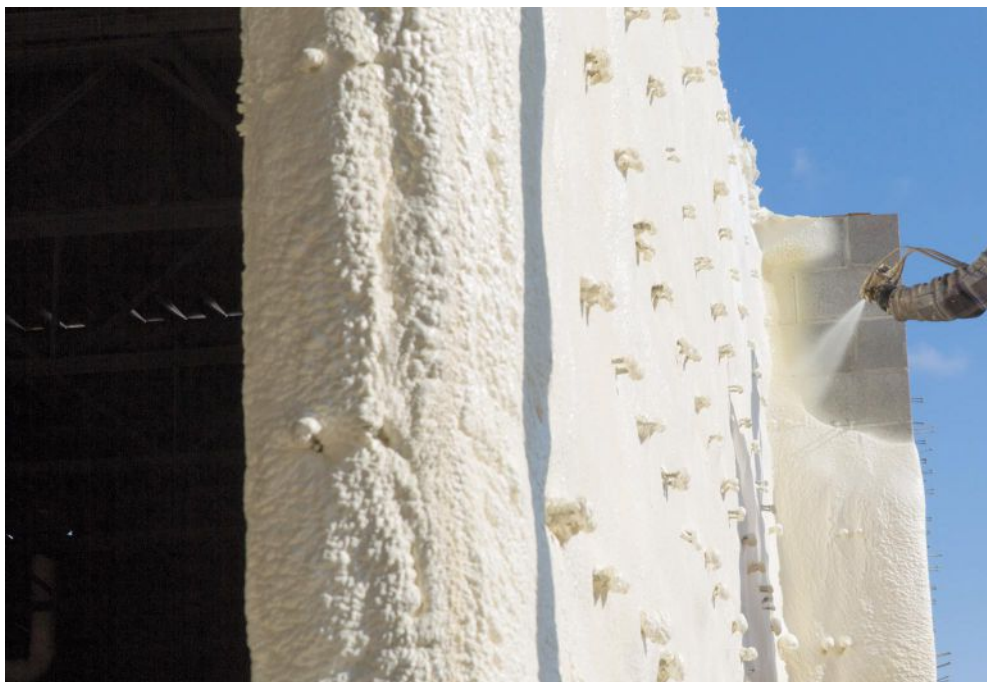
### Vapor Barriers

There is an additional benefit of having full exterior continuous insulation using closed-cell foam, particularly in cold climates. The codes recognize that insulated walls need an interior vapor barrier/retarder to prevent warm, moist air from entering into the wall assembly, condensing, and causing the potential for damage, rot, mold, or other issues. The type of vapor retarder required or prohibited by the code is based on the climate zone where the building is located and the classification listed in the codes based on perm ratings and material. The lower the perm rating, the less water vapor that passes through the material. The code classifies vapor retarders as follows (per 2015 International Building Code [IBC] Section 1405).

- **Class I** vapor retarders have a very low perm rating of less than or equal to 0.1 and include materials such as sheet polyethylene or non-perforated aluminum foil.



Medium-density, closed-cell spray foam insulation adheres to substrates and seals completely around cladding anchors, such as brick ties and other penetrations.



Low-permeability spray foam is recognized by building codes to have vapor-barrier qualities that can reduce the need for other interior vapor retarders.

- **Class II** vapor retarders have a moderate perm rating greater than 0.1 but less than or equal to 1.0, as found in kraft-paper-faced fiberglass batts or certain vapor-barrier-tested paints and closed-cell spray foam insulation.
- **Class III** vapor retarders have a higher perm rating of greater than 1.0 but less than or equal to 10.0 and are common of most latex or enamel paints.

The code goes on to say that there are exceptions to the otherwise required Class I or Class II vapor retarder in colder climates. One of those is the use of minimum R-value levels (based on climate zone) of continuous insulation on the outside of a framed wall. Further, it specifically states that “only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied...on the exterior side of the frame wall,” (2015 IBC Section 1405.3.2). Note that in this code section, medium-density SPF is considered equivalent to foam plastic insulating sheathing and also applies here. In essence, this language is saying that there is no need, in fact there might be harm, in using a higher-rated Class I or Class II vapor retarder in walls that have foam insulation that already provides that attribute. Since medium-density, closed-cell spray foam insulation applied on the outside (or inside) of the exterior sheathing

meets this criteria, there is no need for anything but common latex paint or the equivalent on the inside, finished surface of the wall. This not only means that there is less concern about moisture condensation inside the wall assembly, it also means that the wall has more potential to dry out quickly in the event any wayward moisture does make it there since wall drying is permitted both to the interior and exterior.

#### WATER AND MOISTURE CONTROL

Exterior wall cladding materials (whether masonry, metal, composites, or others) typically do not completely prevent moisture or rainwater from entering into a wall. Some cladding materials are porous, while those that aren't commonly have seams or joints that are limited in their ability to keep out water. In fact, some systems, which are commonly referred to as rainscreen cladding systems, are specifically designed to allow water to enter behind the cladding and drain harmlessly away out of the bottom. While this is good for the cladding, it may not be good for the rest of the wall if it isn't properly treated. That is why building codes require a weather-resistive barrier behind cladding to protect the integrity of the rest of the assembly and prevent degradation of building materials due to rust, corrosion, rot, etc. In practice, this barrier really ends up needing to resist water, and spray foams are tested on their

ability to function as a water-resistive barrier. For purposes of this article, while we are addressing both water and air infiltration resistance, we will stay with the insulation-testing definition of “water-resistant barrier,” abbreviated as WRB.

A number of sheet, roll, and spray-on products have been developed to provide the requisite performance of a WRB. Each of those products have their own limitations, including their own seams or joints, the need for a separate construction step, and the ability to be compatible with other wall materials and products.

#### SPF as a Water-Resistant Barrier

Medium-density, closed-cell spray foam products have been tested as WRBs and demonstrated that they are capable of shedding water and limiting moisture intrusion. Many such products have been evaluated according to the code requirements and criteria for WRBs, and are officially designated as water-resistive barriers accordingly. Since there are no joints to tape or overlapping practices to maintain, water-barrier performance is more easily assured on the construction site with spray foam insulation since it forms a continuous layer. In this case, not only is exterior continuous insulation provided, but water that penetrates past the cladding system and is forced by pressure toward the interior meets the spray foam's exterior surface. The water-resistive nature of the medium-density spray foam is such that this water will drain down along the surface and not continue progressing into the wall assembly where it could cause damage. Such a moisture control system is particularly important to have in coastal or high-precipitation areas where driving rain is common.

Of course, the exterior wall needs to be designed to ensure that this water is actually diverted back outside of the cladding. This is usually accomplished by following an exit path and flashing system incorporated at strategic points in the wall assembly. For example, the typical path that driving rain would take in a masonry veneer cladding over a metal framed wall would be for the water to make its way to a drainage plane on the inside of the masonry or the face of a WRB spray foam surface.

▶ Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)

**Peter J. Arsenault, FAIA, NCARB, LEED AP**, is a practicing architect, sustainable building consultant, continuing education presenter, and prolific author engaged nationwide in advancing better building performance through design. [www.linkedin.com/in/pjaarch](http://www.linkedin.com/in/pjaarch)



Icynene helps architects bring their energy-efficient designs to life with a comprehensive portfolio of high-performance closed-cell and open-cell spray foam insulation solutions. Icynene spray foam insulates and air seal for improved air quality, thermal comfort, and reduced air loss while contributing to LEED points making it the best choice for architects seeking a smarter insulation alternative. [www.icynene.com](http://www.icynene.com)

# Mass Timber in North America

Expanding the possibilities of wood building design

Sponsored by reThink Wood



## Albina Yard

**Location:** Portland, Oregon  
**Architect:** LEVER Architecture  
**Structural Engineer:** KPFF Consulting Engineers  
**Developer:** reworks

*Photo courtesy of LEVER Architecture*

It's been a while since a major category of building materials inspired the kind of widespread enthusiasm currently being shown for mass timber. Around the world, designers are leveraging the strength, stability, and design flexibility of products such as cross-laminated timber (CLT) to push beyond wood's perceived boundaries, achieving building heights and spans that would have once required concrete, steel, or masonry for structural support.

For many, it's the combination of aesthetics, structural performance, and opportunity for innovation that have proven irresistible. But mass timber also offers a host of other advantages:

**Lighter carbon footprint:** Mass timber products allow the use of a renewable and sustainable resource as an alternative to more fossil fuel-intensive materials. Designers of 'tall wood' buildings have been especially focused on the reduced carbon footprint achieved by using wood, which aligns with the goals of Architecture 2030. Reducing carbon is also a priority for many public buildings and schools.

**Construction efficiency:** Mass timber construction is fast, and speed correlates to revenue, whether the project is an office, school, student residence, condominium, or hotel. Bernhard Gafner of structural engineering firm Fast + Epp, says that, in his firm's experience, a mass timber project is approximately 25 percent faster to construct than a similar project in concrete. Noting the advantages for urban infill sites in particular, he says it also offers 90 percent less construction traffic (trucks delivering materials) and requires 75 percent fewer workers on the active deck, making for a much quieter job site.

The fact that mass timber weighs less than other materials also has a number of potential benefits, including smaller foundation requirements and lower forces for seismic resistance. Discussing the new Design Building at the University of Massachusetts, for example, structural engineer Robert Malczyk of Equilibrium Consulting, says, "The seismic force is proportionate to the weight of the building.

## CONTINUING EDUCATION



1.5 AIA LU/HSW



1.5 GBCI CE HOURS

### Learning Objectives

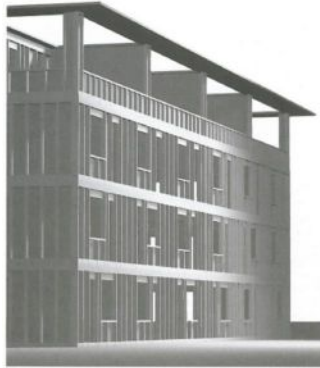
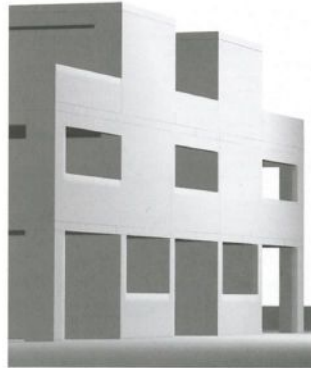
After reading this article, you should be able to:

1. Examine the trend toward mass timber buildings in the context of carbon footprint, construction efficiency, fire and life safety, occupant well-being, and other potential advantages.
2. Identify a range of mass timber products available to North American building designers.
3. Discuss research and resources related to the structural performance and fire/life safety of mass timber products.
4. Based on examples of mass timber buildings either built or under construction, describe how all-wood and hybrid systems are expanding the options for wood design.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free. This course may also qualify for one Professional Development Hour (PDH). Most states now accept AIA credits for engineers' requirements. Check your state licensing board for all laws, rules, and regulations to confirm.

AIA COURSE #K1609D  
 GBCI COURSE #0920010233

Image courtesy of Fast + Epp

**LIGHT WOOD FRAME****POST + BEAM****MASS TIMBER**

Mass timber systems are a complement to light wood-frame and post-and-beam construction.

If this building were designed in concrete, which was considered, the weight would be six times more than the mass timber design.<sup>27</sup>

**Fire and life safety:** Structurally, mass timber offers the kind of proven performance—including fire protection and seismic resistance—that allows its use in larger buildings. It also expands the options for exposed wood structure in smaller projects.

**Occupant well-being:** An increasing number of studies focused on wood's biophilic aspects have linked the use of exposed wood in buildings with improved occupant health and well-being.<sup>1,2</sup>

This course is intended for architects and engineers seeking current information on mass timber, including products, research related to structural performance and life safety, and available resources. It answers common questions regarding strength, fire protection, and durability, and highlights examples of mass timber buildings in different occupancy groups to illustrate both design trends and the extent to which mass timber has captured the imagination of North American building designers.

**WHAT IS MASS TIMBER?**

Mass timber is a category of framing styles typically characterized by the use of large solid wood panels for wall, floor, and roof construction. It also includes innovative forms of sculptural buildings, and non-building structures formed from solid wood panel or framing systems of six feet or more in width or depth. Products in the mass timber family include:

**Cross-Laminated Timber (CLT)**

CLT consists of layers of dimension lumber (typically three, five, or seven) oriented at right angles to one another and then glued to form structural panels with exceptional strength, dimensional stability, and rigidity.

Panels are particularly cost effective for multistory and large building applications. Some designers view CLT as both a stand-alone system and product that can be used together with other wood products; it can also be used in hybrid and composite applications. CLT is well-suited to floors, walls, and roofs, and may be left exposed on the interior for aesthetics. Because of the cross-lamination, CLT also offers two-way span capabilities.

CLT can be manufactured in custom dimensions, with panel sizes varying by manufacturer. There are several CLT suppliers in North America, with more anticipated. The species of wood used depends on the manufacturing plant location.

The 2015 International Building Code (IBC) and 2015 International Residential Code recognize CLT products manufactured according to the ANSI/APA PRG-320: Standard for Performance Rated Cross-Laminated Timber. Under the 2015 IBC, CLT at the required size is specifically stated for prescribed use in Type IV buildings. However, CLT can be used in all types of combustible construction—i.e., wherever combustible framing or heavy timber materials are allowed. The National Design Specification® (NDS®) for Wood Construction is referenced throughout the IBC as the standard for structural wood design, including CLT. The 2012 IBC does not explicitly recognize CLT, but the 2015 IBC provisions for CLT can be a basis for its use under alternative method provisions.

For more information on CLT, the *U.S. CLT Handbook* is available as a free download at [www.rethinkwood.com](http://www.rethinkwood.com).

**Nail-Laminated Timber (NLT or Nail-lam)**

NLT is created from individual dimension lumber members (2-by-4, 2-by-6, 2-by-8, etc.),

Photo courtesy of StructureCraft



Designed by MGA, the seven-story T3 building in Minneapolis, Minnesota, includes glulam columns and beams, and NLT floors. (See [Office/Mixed-Use.](#))

stacked on edge, and fastened with nails or screws to create a larger structural element.

NLT is far from new—it's been used for more than a century—but is undergoing a resurgence as part of the modern mass timber movement. Commonly used in floors, decks, and roofs, it offers the potential for a variety of textured appearances in exposed applications, and wood structural panels can be added to provide a structural diaphragm. NLT has also been used to create elevator and stair shafts in midrise wood-frame buildings.

NLT naturally lends itself to the creation of unique roof forms. Because panels are comprised of individual boards spanning in a single direction, both singly curved and freeform panels can be created by slightly offsetting and rotating each board relative to the others. This allows the complex geometry of curved roof and canopy structures to be realized with a simple system.

Advantages of NLT include the ability to use locally available wood species and the fact that specialized equipment generally isn't necessary. An NLT system can be created via good on-site carpentry, though some suppliers do offer prefabrication, and this can have benefits depending on the scale and complexity of the project. Prefabricated NLT panels typically come in sizes up to 10 feet wide and 60 feet long, with wood sheathing preinstalled. When detailing NLT systems, designers need to account for moisture movement.

The IBC recognizes NLT and provides guidance for structural and fire design. No product-specific ANSI standard is required, as the structural design of each element is covered by the NDS and applicable grading rules. NLT can be used in all types of combustible construction.

### Glued-Laminated Timber (glulam)

Glulam is composed of individual wood laminations (dimension lumber), selected and positioned based on their performance characteristics, and then bonded together with durable, moisture-resistant adhesives. The grain of all laminations runs parallel with the length of the member.

Glulam has excellent strength and stiffness properties, and is available in a range of appearance grades for structural or architectural applications. While typically used as beams and columns, designers can use glulam in the plank orientation for floor or roof decking. With careful specification and design that considers the flatwise structural properties (see APA reference below), deep glulam sections can be placed flatwise as decking similar to NLT. With the flexibility of glulam manufacturing, glulam 'panels' can be used to create complex curvature and unique geometry. When used in such innovative floor and roof panel configurations, glulam is seen as an extension of the mass timber product family and sometimes referred to as GLT.

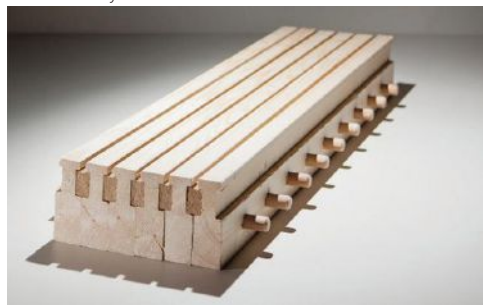
The IBC recognizes glulam products manufactured in conformance with ANSI Standard A190.1-2012: Standard for Wood Products—Structural Glued Laminated Timber. For more information, consult the *Glulam Product Guide* available at [www.apawood.org/glulam](http://www.apawood.org/glulam).

### Dowel-Laminated Timber (DLT)

Dowel-laminated timber panels are a next-generation mass timber product commonly used in Europe. Panels are made from softwood lumber boards (2-by-4, 2-by-6, 2-by-8, etc.) stacked like the boards of NLT and friction-fit together with dowels. Typically made from hardwood lumber, the dowels hold each board side-by-side, similar to how nails work in an NLT panel, and the friction fit lends some dimensional stability to the panel.

There isn't a prescriptive code path for the use of DLT under the current IBC, and the NDS doesn't provide published design values

Photo courtesy of StructureCraft



Pictured is a dowel-laminated timber panel with an acoustic profile integrated into the exposed surface.



Photo courtesy of LEVER Architecture

### ALBINA YARD & FRAMEWORK

**Location:** Portland, Oregon

**Architect:** LEVER Architecture

**Structural Engineer:** KPFF Consulting Engineers

**Design Assist + Build (Framework):** StructureCraft

**Developer (Albina Yard):** reworks

The four-story, 16,000-square-foot Albina Yard is noteworthy for being the first commercial building in the United States to use domestically fabricated CLT as a structural element. A Type III project designed under the 2014 Oregon Structural Specialty Code, it is also interesting as a precursor to another LEVER-designed office project—Framework, the 12-story winner of the U.S. Tall Wood Building Prize Competition.

"We were very interested in exploring a mass timber/CLT project on a smaller scale prior to building the larger high-rise project, so it was a very fortunate coincidence," says Design Principal Thomas Robinson. Asked about lessons learned, he emphasized the need for early collaboration between architectural, structural, mechanical, and installation. "Each discipline had a role to play; input and problem solving needed to happen together. As the building was essentially prefabricated off-site, the coordination and problem solving that often occurs in the field needed to be accounted for beforehand. After we were off the ground-floor slab, Albina Yard was built to a 1/8-inch tolerance, and it went together perfectly."

Currently in design, Framework will consist of ground-floor retail, five levels of office space, five levels of housing, and a rooftop community space. It is expected to include CLT floor panels as well as a new system of post-tensioned rocking wall panels.

Developed for use in high seismic regions, rocking mass timber shear walls were tested by the Network for Earthquake Engineering (NEES) as part of its CLT Planning Project. Seismic activity was simulated by cyclic loading that pushed and pulled the top of a 16-by-4-foot CLT panel with an embedded vertical pretensioned rod into a rocking motion. The wall was able to reach 18 inches of displacement, while maintaining its ability to self-center back to a vertical position.

Framework, which is scheduled for completion in 2018, is expected to be the first application of a rocking mass timber shear wall system in the United States.

or equations for calculating capacities of wood dowel joints. To calculate capacities, the Timber Framers Guild provides some information. However, because nothing is referenced in the code, the use of DLT would require approval by the Authority Having Jurisdiction on a case-by-case basis.

Among the advantages of DLT, acoustic strips can be integrated directly into the bottom surface of a panel. This can help a designer achieve acoustic objectives, while keeping the wood exposed and allowing for a wide variety of surface finishes.

With growing interest in DLT, continued product innovation is likely, along with increased availability to U.S. building designers.

### Structural Composite Lumber (SCL)

SCL is a family of wood products created by layering dried and graded wood veneers, strands, or flakes with moisture-resistant adhesive into blocks of material, which are subsequently re-sawn into specified sizes. Two SCL products—laminated veneer lumber (LVL)

and laminated strand lumber (LSL)—are relevant to the mass timber category, as they can be manufactured as panels in sizes up to 8 feet wide, with varying thicknesses and lengths, depending on the product and manufacturer. Parallel strand lumber (PSL) columns are also commonly used in conjunction with other mass timber products.

The manufacture of SCL is standardized. However, while SCL is included in the NDS, design values are provided by the manufacturers. International Code Council Evaluation Service (ICC-ES) evaluation reports and APA product reports are available to assist with structural design capacities and specifications.

### Wood-Concrete Composites

Mass timber systems vary widely, and hybrids are an option for wood high-rises, very long spans, or other project-specific requirements. No material is perfect for every job, and it's important for designers to choose a combination of materials that effectively meets the performance objectives.



At a product level, most of the panels described above can be made into a wood-concrete composite by applying a concrete topping in such a way that the two materials act as one.

One example is the University of Massachusetts Design Building described later in this course (see Schools), which includes CLT/concrete composite floors. According to architect Tom Chung of Leers Weinzapfel Associates, the team relied on the CLT panels for the building load requirements. However, the composite action between the CLT and concrete provided extreme stiffness and minimal deflection which, along with an insulation layer between the materials, provided good acoustic separation between floors.

### WHEN IS MASS TIMBER APPROPRIATE?

Because of its strength and dimensional stability, mass timber offers a low-carbon alternative to steel, concrete, and masonry for many applications. A complement to other wood framing systems, it can be used on its own, in conjunction with other wood systems such as post-and-beam, or in hybrid structures with steel or concrete. Mass timber is not necessarily a good substitute for light wood-frame construction, only because dimension lumber framing offers such a compelling combination of performance and cost where permitted by code. For this reason, building types where designers typically default to forms of construction other than light wood-frame—including offices, public/institutional buildings, schools, and taller mixed-use occupancies—may offer greater appeal for mass timber than low-rise commercial or residential buildings, though examples of the latter do exist.

“We’re seeing a lot of interest in mass timber for midrise buildings such as hotels and high-end offices that would have typically used concrete or steel,” said Lucas Epp of StructureCraft, a specialty timber engineering and construction company known for innovative wood structures. “In addition to the warmth of exposed wood, people are discovering that it’s a viable option for creating high-performing and cost-competitive structures.”

Thomas Robinson, whose firm is designing three mass timber projects in addition to Albina Yard and Framework, sees particular potential in multifamily housing and other building types that lend themselves to modular prefabrication. “The time spent upfront designing and perfecting a building system can be leveraged in projects where you have repeatable elements,” he says.

### Office/Mixed-Use

For office environments, the aesthetic of mass timber can be a particular draw, resulting in higher rents and longer-term tenants.

## MASS TIMBER: AN EFFICIENT SOLUTION

In addition to the structural, aesthetic, and environmental advantages, mass timber can be an efficient and practical solution to design challenges.

With prefabricated panels, mass timber construction is fast—approximately 25 percent faster than concrete, according to Bernhard Gafner of Fast + Epp, based on his firm’s experience. Gafner says it also results in 90 percent less construction traffic and 75 percent fewer workers on the active deck, making it well-suited to urban infill sites.

Because mass timber is lighter than steel and concrete, it can be a good solution for sites where poor soil is an issue.

There is also a trend toward the integration of services into prefabricated elements, such as panels and trusses. The fact that the labor is done off-site means greater quality control and a less hectic job site.

The Radiator in Portland, Oregon—a five-story, Type IIIA project completed in 2015—is part of a surge of mass timber offices in the Pacific Northwest. Designed by PATH Architecture for the Kaiser Group, gravity loads for the 36,000-square-foot structure are handled through a system of glulam beams and columns, while a mass timber deck with wood structural panels creates the structural floor diaphragm, and dimension lumber walls sheathed with wood structural panels provide shear capacity. Beams, columns, and the underside of the floor decking are all left exposed, contributing to the interior’s contemporary industrial character.

Further expanding the possibilities, the seven-story, 220,000-square-foot T3 building in Minneapolis, Minnesota, includes a mix of glulam

columns and beams, NLT floors, and a concrete core. Architect Michael Green, a long-time advocate of using wood to reduce the carbon footprint of buildings, calls the Type IV project “a game changer for the commercial building industry and a milestone for mass timber construction in the United States.” In addition to its carbon benefits, Green cites the ability of modern wood products to bring warmth and beauty to the interior, while promoting a healthy indoor environment.

Demonstrating some of the efficiencies associated with mass timber, the wood structure of T3 took an average of nine days to erect per 30,000-square-foot floor. More than 100 truckloads of glulam and NLT panels arrived as they were needed at the project site, with steel connections preinstalled, allowing the structural components to be assembled quickly. The project team estimates that it is 30 percent lighter than a comparable steel design and 60 percent lighter than post-tension concrete.

### Public and Institutional

Reasons to use mass timber in public and institutional buildings are similar to those for offices and schools, including carbon footprint, and wood’s biophilic effects. The aesthetic possibilities are also exciting to many designers.

In the United States, examples include Chicago Horizon, a Type IV public pavilion designed by Ultramoderne for the Chicago Architecture Biennial. Elegantly crafted, this award-winning structure includes a CLT roof supported on 13 glulam columns distributed in a radial pattern to address lateral loads and uplift. The pavilion represents the first use of exposed CLT in the city of Chicago, providing local precedent for the approval and use of mass timber for government and public assembly applications. In addition, the two-way slab roof is the first of its kind, suggesting new opportunities for open-layout buildings made from CLT. The planned long-term use of the building as a commercial vendor and public assembly space is a significant and sustainable

*Image courtesy of Michael Green Architecture*



**T3**  
**Location:** Minneapolis, Minnesota  
**Design Architect:** Michael Green Architecture  
**Architect of Record:** DLR Group  
**Structural Consultant:** MKA  
**Design Assist + Build:** StructureCraft

departure from the typical design exhibition model of temporary installations.

With a growing body of research supporting the positive impacts of wood on occupant well-being, there is also a trend toward the use of mass timber in healing environments.

### Schools

Mass timber has a number of characteristics that make it attractive for schools and universities—from the ability to construct an entire project over the summer while students are off campus, to the potential efficiencies of replicable modular designs, a lighter carbon footprint, and the positive impacts of exposed wood on student well-being.

For a 14,000-square-foot addition to Common Ground High School in New Haven, Connecticut, for example, Gray Organschi Architecture and engineering partner Bensonwood chose a combination of CLT and glulam. CLT panels provide the tension surface (and final ceiling finish) in a system of prefabricated stressed skin assemblies that span the upper classrooms and circulation spaces. Vertical CLT panels form bearing and shear walls throughout the building, while glulam rafters and heavy timber trusses span a large ground-floor multipurpose space. A treated glulam bridge deck on laminated timber piers provides access from the upper campus.

Discussing some of the advantages of mass timber, Design Principal Alan Organschi says, “CLT and glulam can serve as both primary structure and finished interior surface at the same time. This creates efficiencies in deploying trades and sequencing construction, which has very real monetary implications. As the construction industry, accustomed to building institutional buildings like schools using conventional wall, roof, and floor assemblies, gains more experience with these versatile new timber products, greater production economies will accrue and more of timber’s potential benefits—light weight, high strength, workability, etc.—will be captured.”

Organschi also stressed construction speed. Assisted only by a mobile crane, a five-person assembly crew installed the entire primary structure and enclosure in just four weeks.

Regarding the impact of wood on students and teachers, he adds, “It’s well-known that, as a hygroscopic material (cellular plant structure), wood surfaces serve as moisture buffers, moderating swings in interior humidity and thereby improving air quality. It’s worth mentioning

that during the first few weeks the new building was being used, a teacher commented to me that people were remarking on the freshness of the air in the classrooms. Anecdotal, I know, but it squares with the scientific predictions of health benefits of using wood (especially unfinished wood) in building interiors.”

Common Ground High School is Type VB Construction, fully sprinklered, and was designed under the 2005 Connecticut State Building Code.

Another example, the Design Building at the University of Massachusetts – Amherst (UMass), features an exposed glulam post-and-beam structure, CLT decking and shear walls, CLT/concrete floors (rigidly connected by glued-in steel fasteners), and a ‘zipper truss’ roof spanning a two-story-high common space.

One challenging aspect of this project was that it started as a steel design. Keen to make the building a showcase for sustainability, the university made the decision to use wood part way through the design process.

Noting that he may have made different choices had he started with wood, architect Tom Chung of Leers Weinzapfel Associates said, “Generally, mass timber doesn’t have to radically change the design concepts we already use; we can accomplish what we are already familiar with in steel and concrete. Steel post-and-beam can be done as glulam post-and-beam. Concrete/masonry shafts can be done in CLT. Steel/concrete floors can be CLT/concrete floors. A steel deck roof can be a CLT roof. Steel braces can be glulam braces. For the UMass project, we went step by step, asked ourselves what the precedents were and how we could go about maximizing the use of timber.

“If the project started out in wood and the primary objective was to design the most efficient mass timber building, then the shape and massing may have been more along the lines of a conventional ‘box,’ which is the shape of most of the mass timber structures built so far. But since there were other important design objectives, the UMass building has unique angles and cantilevers that required steel in addition to wood. Our goal was to use the most appropriate materials to meet the structural objectives at hand.”

Chung also said that educating code officials is an important part of the process. The UMass project team was in constant communication with a Massachusetts state building inspector and, because the building represented a new type of construction, also went before the Massachusetts state board of appeals for official

Photo courtesy of David Sundberg

### Common Ground High School

**Location:** New Haven, Connecticut  
**Architect:** Gray Organschi Architecture  
**Timber Engineer:** Bensonwood



approval. The project was approved after the team was able to demonstrate its performance capabilities as well as the long history of mass timber structures in Europe and Canada.

Scheduled for completion in 2017, the UMass project is a combination of Type IV and IIB Construction.

### Multifamily and Hospitality

In the United States, a recent example of a multi-story mass timber building is a four-story CLT hotel, Candlewood Suites at Redstone Arsenal, an Army base near Huntsville, Alabama. Developed and designed by Lendlease, the hotel is part of the Privatization of Army Lodging (PAL) program, created to provide quality private-sector lodging for soldiers and their guests. Compared to typical PAL hotel of 54,891 square feet, Lendlease says the new 62,688-square-foot CLT hotel was erected in 37 percent less time, with a 44 percent reduction in structural person hours. In terms of structural performance, the hotel’s location on a military base meant it also had to meet Anti-Terrorism and Force Protection standards.

► Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)



reThink Wood represents North America’s softwood lumber industry. We share a passion for wood and the forests it comes from. Our goal is to generate awareness and understanding of wood’s advantages in the built environment. Join the reThink Wood community to make a difference for the future. Get the latest research, news, and updates on innovative wood use. Visit [reThinkWood.com/CEU](http://reThinkWood.com/CEU) to learn more and join.

Photo courtesy of Duro-Last®, Inc.



# Reflective Roofs and Urban Heat Islands

Protecting people, the environment, and the economy

Sponsored by Duro-Last®, Inc. | By Dr. James L. Hoff, DBA

**T**his course provides an overview of the urban heat island effect that impacts almost all major cities across the globe. The course suggests that urban heat islands pose a significant problem, negatively affecting the world economy, environment, public safety, and human health. Based on a review of the available strategies to mitigate the negative consequences of the heat island effect, the course also suggests that reflective roofs offer the most feasible and cost-effective way to immediately start improving conditions in urban heat islands. Finally, the course suggests that cool reflective roofs, when designed and installed correctly, may provide many years of useful service, while reducing heat island impacts at the same time.

## WHAT IS AN URBAN HEAT ISLAND?

As urban areas across the globe have grown in size and density, significant changes have taken place

in their landscapes. Buildings, roads, parking lots, and other infrastructure have replaced open land and vegetation. Surfaces that once were permeable and moist have become impermeable and dry. These changes cause urban regions to become warmer than their rural surroundings, forming “islands” of higher temperatures in the landscapes.

It is important to note that the heat island effect occurs both on the surface and in the atmosphere. By noon on a hot summer day, the sun can heat urban surfaces, such as roofs and pavements, to temperatures 50 to 90 degrees Fahrenheit hotter than the air. In turn, these surfaces radiate additional heat into the atmosphere, causing a similar but not as extreme increase in air temperature. This atmospheric heating becomes more pronounced after sunset, as urban surfaces continue to radiate heat into the surrounding air.

➤ Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)

## CONTINUING EDUCATION

CONTINUING EDUCATION  
 1 AIA LU/HSW

### Learning Objectives

After reading this article, you should be able to:

1. Explain the basic science behind the urban heat island effect.
2. Identify the risks and consequences of the urban heat island effect on cities and their residents.
3. Discuss the strategies currently available to mitigate the effects of urban heat islands.
4. Define the key criteria for designing and selecting a reflective roofing system to optimize its contribution in mitigating the urban heat island effect.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

AIA COURSE #K1609H



Known as the “World’s Best Roof®,” a Duro-Last®, Inc. roof is perfect for any flat, low-sloped, new, or retrofit application. Precision-fabricated accessories combined with prefabricated deck sheets or roll goods allow for a watertight roof that doesn’t sacrifice aesthetics. [www.duro-last.com](http://www.duro-last.com)

# XtremeTrim®



## MODERN ARCHITECTURAL LINES

XTREMETRIM® PROFILES ARE AVAILABLE TO PERFECTLY MATCH MULTIPLE PANEL SIDING SYSTEMS. XTREMETRIM® HAS THOUSANDS OF DESIGN AND COLOR OPTIONS, ALLOWING ARCHITECTS AND USERS TO DRAMATICALLY IMPROVE THEIR BUILDING AESTHETICS AND CREATE MODERN ARCHITECTURAL LINES.

[WWW.XTREMETRIM.COM](http://WWW.XTREMETRIM.COM) | 800-334-1676

CIRCLE 34



Pilkington **OptiView™**



Pilkington **Optiwhite™**



anti-reflective glass



low iron glass

With Pilkington **Optiwhite™** and Pilkington **OptiView™**, the possibilities are endless.

Whatever you have in mind for your next ambitious project, you should have our Special Applications Glass in mind too. Pilkington **Optiwhite™** is an extra clear, low iron float glass that is virtually colorless and has excellent light transmission, making it the ideal choice for applications where glass edges are visible or where transparency and purity of color are desired.

Pilkington **OptiView™** has low-reflective and UV blocking properties which make it perfect for any display, showroom or storefront applications. Pilkington **OptiView™** also minimizes visible light reflectance to less than two percent.

800.221.0444 | [buildingproducts.pna@nsg.com](mailto:buildingproducts.pna@nsg.com) | [www.pilkington.com/na](http://www.pilkington.com/na)



**DOORS, WINDOWS**
**ADJUSTABLE CONCEALED HINGES**
**\$\$\$**
**SIMONSWERK North America, Inc.**

The TECTUS 3-way adjustable concealed hinge series for doors offers designers and architects an entire range of hinges for different architectural openings.

**Product Application**

- Hospitality: Armani Hotel, Burj Khalifa, Dubai, UAE
- Residential: 2012 Olympic Village, London, UK
- Retail: Apple Retail Stores, global

**Performance Data**

- Maintenance-free slide bearings for doors up to 300 kg/660 lb – designed for high-frequency use (not limited to low-frequency applications)

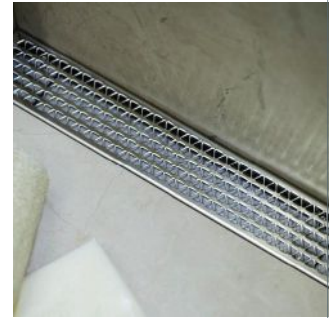

[www.simonswerk-usa.com](http://www.simonswerk-usa.com)

 262.472.9500 | [info@simonswerk.com](mailto:info@simonswerk.com)
**Circle 45**
**MECHANICAL SYSTEMS, HVAC, PLUMBING**
**MARC NEWSON LINEAR SHOWER DRAINS**
**Infinity Drain**
**Product Application:**

- Linear shower drains designed by acclaimed icon of modern design, Marc Newson.

**Performance Data:**

- 304 Stainless Steel
- Six finish options
- 5 stocked lengths, custom fabrication available
- Works with traditional or modern waterproofing
- Fabricated in Long Island, NY


[www.InfinityDrain.com](http://www.InfinityDrain.com)

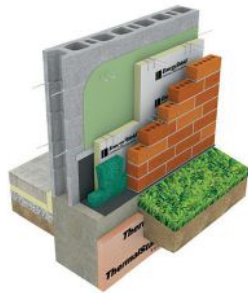
516.767.6786

**Circle 46**
**ROOFING, SIDING, THERMAL & MOISTURE PROTECTION**
**CONTINUOUS WALL INSULATION**
**Atlas Roofing**

EnergyShield® is a high performance rigid insulation board with a polyiso foam core. Offering high R-value and faced with durable foil or coated glass, it's engineered for a variety of applications.

- EnergyShield® (CI) for walls, including wood frame, steel frame or concrete. Use with multiple cladding types: stucco, siding, metal, brick and stone masonry veneers.

- EnergyShield® products are available to meet Class A requirements and have been tested in NFPA


[www.atlasroofing.com/continuous-wall-insulation](http://www.atlasroofing.com/continuous-wall-insulation)

678.402.9639 | John Hurst

Booth: 454

CONSTRUCT

**Circle 47**
**ROOFING, SIDING, THERMAL & MOISTURE PROTECTION**
**ARCHITECTURAL PRECAST CONCRETE CLADDING**
**GREEN | WR**
**Easi-Set Worldwide**

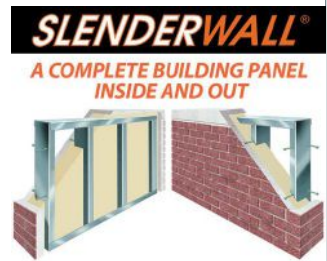
Ultra Hi-Performance SlenderWall is a 28 lb/sf award-winning architectural precast concrete and integral steel-stud building panel system. Wind load tested to 226 mph. Continuous foam insulation.

**Product Application**

- BioInnovation Center, New Orleans, LA
- Hilton Hotel, Montreal, Quebec, Canada
- Westin Luxury Hotel, Virginia Beach, VA
- US Army Legal Headquarters, Ft. Belvoir, VA

**Performance Data**

- Compliant with all IECC/ASHRAE energy codes


**SLENDERWALL®**
**A COMPLETE BUILDING PANEL INSIDE AND OUT**

- Fewer on-site trades • Faster installation
- Lower structural cost • Class "A" finishes

[www.slenderwall.com](http://www.slenderwall.com)

 800.547.4045 | [info@easiset.com](mailto:info@easiset.com)
**Circle 48**
**ROOFING, SIDING, THERMAL & MOISTURE PROTECTION**
**SAFETY GRAB BARS FOR ROOF HATCHES**
**\$**
**LadderTech LLC dba LadderPort**

LadderPort Roof Hatch Grab Bars, the only system meeting OSHA regulations. Safely transition in/out using solid handles. Adjustable to fit hatches 24"-48" without concern for ladder placement. Securely mounted with patented fastening system. Nothing to mount on ladder leaving ladder available. No moving parts to fail. Easy installation. Made In USA. Patent US 8,099,910 B1.

**Product Application:**

- Roof Hatches 24" – 48"
- Caged Model w/ Gate Available

**Performance Data:**

- Meets OSHA Reg 1910.27(d)(3)
- ASTM spec steel
- Powder coated
- Protected w/ aviation grade corrosion inhibitor

[www.ladderport.com](http://www.ladderport.com)

 800-770-8851 | [sales@ladderport.com](mailto:sales@ladderport.com)

**Circle 49**
**ARCHITECTURAL  
RECORD**
**125 years**
[architecturalrecord.com](http://architecturalrecord.com)

**MAKING THE COMPLEX CLEAR**

Clear Seas Research is an industry-focused market research company dedicated to providing clear insights to complex business questions. Capturing feedback via quantitative surveys (online, phone, mail or in-person) OR qualitative experiences (one-on-ones, focus groups or bulletin boards), we present results that are easily understood, insightful and actionable.

[www.clearseasresearch.com](http://www.clearseasresearch.com)
**Clear Seas**  
RESEARCH  
Making the complex clear

# Advertisers Index

## Get Free Information

from our advertisers! Fill out this Reader Service Card and send back today  
or go to [ArchRecord.com](http://ArchRecord.com) > Products tab > Reader Service



Reader Service #	Advertiser	Page	Reader Service #	Advertiser	Page	Reader Service #	Advertiser	Page
192	ABC Stone Trading	224	207	Construction Specialties, Inc.	100	8	modular Arts	72
175	Acme Brick Company	64, 65	206	Cosella-Dörken Products, Inc.	216	150	NanaWall Systems	239
249	ACP Express	37	221	CPI Daylighting Inc	137	186	National Terrazzo & Mosaic Association	97, 235
1	Advance Lifts	268	241	C. R. Laurence Co., Inc.	66	236	Oldcastle Architectural	96
240	AISC	136	4	Doug Mockett & Company, Inc.	52	12	Ornamental Metal Institute Of New York	10
57	Aluflam North America LLC	266	220	Dow Corning	217	238	Otis Elevator Company	77
142	American Standard	60, 61	222	Dri-Design	198	215	Oldcastle BuildingEnvelope	2, 3
	Architectural Record - Customer Service	258	35	Dryvit Systems	16, 35	242	Pella EFCO Commercial Solutions	18
	Architectural Record Fall Innovation Conference	271	225	Earthcam	28	243	Petersen Aluminum	44
	Architectural Record - Record On The Road	58	227	Epic Metals Corp.	199	83	Pilkington North America	255
	Architectural Record - Guess The Architect	34	92	Excel Dryer	237	255	PPG Architectural Coatings	76
	Architectural Record - CE Center	270	79	Florida Tile	84	75	PPG Industries, Inc.	6, 7
	Architectural Record - CEU APP	224	99	Formica	138	208	PPG Industries, Inc.	81
	Architectural Record - Architecture And Design Film Festival	262	182	Guardian Industries Corp.	233	191	Prodema	203
224	Armstrong Commercial	CV2, 1	246	Fry Reglet	82	34	RH Tamlyn & Sons	254
31	AS Hanging Systems	206	29	Glen-Gery	41	134	Rieder Group	8, 9
95	ASI Accurate Partitions	59	78	Headwaters Resources	269	32	Rockfon	98
72	ASI Global Partitions	51	61	Heather & Little	269	188	Rocky Mountain Hardware	95
84	ASI Group	69	19	Huber Engineered Woods LLC	201	248	SAFTIFIRST	38
81	American Specialties, Inc.	29	193	Humanscale	202	76	Samsung	CV3
30	ATGStores.com	83	196	Humboldt Redwood	215	14	Seiho	269
74	Atlas Roofing Corporation	70	5	Huntco Supply LLC	31	132	Sherwin Williams	33
211	BEGA	204	230	ICC Evaluation Services (ICC-ES)	259	179	Simpson Strong-Tie Company Inc.	11
180	Belden Brick Company, The	42, 43	234	Icynene, Inc.	220	15	Skyscraper Museum, The	269
210	Bison	205	229	JELD-WEN	78	91	Soil Retention	208
2	B-K Lighting	268	36	Johns Manville	222	143	Sonneman	158
	Bluebeam Software Inc	20	194	Julius Blum & Co., Inc.	49	12	Steel Institute Of New York	12
217	Bobrick Washroom Equipment, Inc.	56	6	Kemper System	32	56	Studio 804	267
80	Bulthaup	218	90	Kornegay Design LLC	13		Sub-Zero Group, Inc.	74
214	CANAM	260	77	La Cantina Doors	73	27	Technical Glass Products	4, 5
213	CAPTIVEAIRE	200	94	Lafarge Holcim	223	177	The Sliding Door Company	157
183	CAST CONNEX	75	137	Laminators Incorporated	71	237	Tournesol Siteworks	79
219	Ceilings Plus	14, 15	174	Landscape Forms	197	28	U.S. Green Building Council	213
181	CENTRIA	62, 68	138	Longboard (Mayne Coatings Corp.)	156	195	VS America	CV4
232	Construction Specialties, Inc.	55	73	LP Building Products	80	167	Western Red Cedar Lumber Association	219
			159	Lucifer Lighting	85	33	Wooster Products Inc.	207
			166	Marble Institute Of America	261	200	Xypex	221
			190	MechoSystems	263			
			153	Metl-Span	99			
			86	METRIE	22, 23			

# ARCHITECTURAL RECORD



WE HAVE A **NEW** CUSTOMER SERVICE DEPARTMENT



Toll free phone number is still

**877-876-8093**



Subscribers outside the  
U.S. please call

**818-487-2077**



New email address is

**AR@pubservice.com**



We've also recently updated our website and mobile app access process, so if you're having trouble please contact customer service for assistance.

New Mailing Address: Architectural Record • PO Box 16387 • North Hollywood, CA 91615



Design with

# CONFIDENCE



## When facing new or unfamiliar materials, how do you know if they comply with building codes and standards?

- ICC-ES® Evaluation Reports are the most widely accepted and trusted technical reports for code compliance. When you specify products or materials with an ICC-ES report, you avoid delays on projects and improve your bottom line.
- ICC-ES is a subsidiary of ICC®, the publisher of the codes used throughout the U.S. and many global markets, so you can be confident in their code expertise.
- ICC-ES provides you with a free online directory of code compliant products at: [www.icc-es.org/Evaluation.Reports](http://www.icc-es.org/Evaluation.Reports) and CEU courses that help you design with confidence.

**WWW.ICC-ES.ORG | 800-423-6587**



Take ICC-ES's **FREE "Innovative Material Use in Residential Design"** course at [www.icc-es.org/RDC](http://www.icc-es.org/RDC) and earn 1.00 AIA/CES Learning Unit.



ANSI Accredited Program  
PRODUCT CERTIFICATION  
#1000

# FAST-TRACK YOUR BEST IDEAS



## MUROX

THE PREFABRICATED BUILDING ENVELOPE SYSTEM  
THAT SETS YOUR IMAGINATION FREE

Take design-build to a whole new level with Murox, the fast-track construction solution that accelerates your projects without compromising your creative vision. Our prefabricated wall panels are factory-built to your exact specifications and delivered construction-ready to your worksite. Coupled with our **BuildMaster** approach, **Murox** reduces commercial, industrial, and institutional build times by up to 50%. So forget your prefab preconceptions and experience Murox. You'll never look back.



CIRCLE 214



**CANAM**  
BUILDINGS

canam-construction.com  
1-866-466-8769

Congratulations on 125 Years

# ARCHITECTURAL RECORD

The natural stone industry understands the importance of longevity.



Photo courtesy Goldspring

Learn more at [www.usenaturalstone.com](http://www.usenaturalstone.com), your source for natural stone resources and inspiration.



Powered by



PRESENTED BY **A/D/O**

# architecture & design film festival



**NYC**  
**SEPT 28 /**  
**OCT 2**



**ADFF is the nation's largest film festival devoted to  
the creative spirit of architecture and design.**

This fall's eighth season features a fantastic lineup of  
events – over 30 films, filmmaker Q&As, spirited panel  
discussions, great parties and much more.

**DESIGN DIRECTS EVERYTHING** [ADFILMFEST.COM](http://ADFILMFEST.COM)



**Sciame**  
WHERE BUILDING IS AN ART

 **COSENTINO**

**Molteni & C**

 **The American  
Institute  
of Architects**

**ARCHITECTURAL  
RECORD**

**NOVITĀ**  
communications

MechoSystems makes the key automated window-shading ingredients for LEED® points in numerous categories. Our automated SolarTrac® WindowManagement® system and Cradle to Cradle Certified™ EcoVeil® shadecloth are part of the recipe for the LEED Platinum-rated USGBC Headquarters.

Visit us at Greenbuild, booth no. 1343 and GreenZone, booth no. 2101.



**SolarTrac®**  
Ultimate in WindowManagement®

**MechoSystems**  
Design with light.®

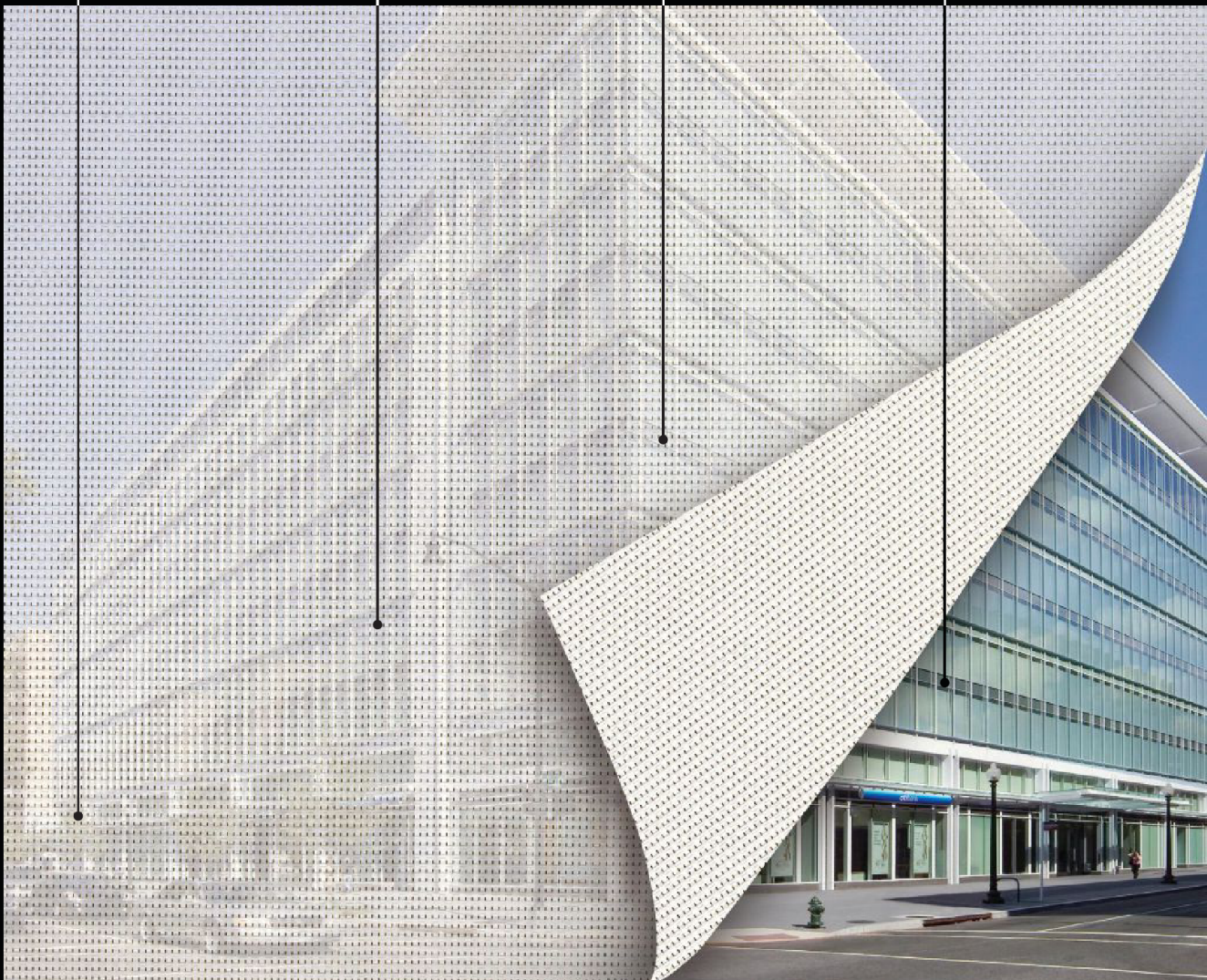
T: +1 (718) 729-2020  
E: [marketinglic@mechosystems.com](mailto:marketinglic@mechosystems.com)  
W: [mechosystems.com/automation](http://mechosystems.com/automation)  
f t i n @mechosystems

SolarTrac calculates sun angles according to building and zone criteria.

Natural light is optimized, and outside views are maximized.

Radiometers monitor real-time sky conditions to control shade positions.

Shades adjust automatically to manage glare and solar-heat gain.



LEED Platinum-rated USGBC Headquarters in Washington, D.C.

## Photography Credits

### Page 102

Wainwright Building: courtesy Library of Congress  
Glasgow School of Art: © Alan McAtaer, courtesy Glasgow School of Art  
Larkin Building: Architectural Record  
Morgan Library & Museum: © Graham Haber, courtesy the Morgan Library and Museum  
Austrian Postal Savings Bank: © Doris Herlinger, Postparkasse Archive  
Gamble House: © Alexander Vertikoff, The Gamble House, USC  
Unity Temple: courtesy Library of Congress

### Page 103

Kärntner Bar: © Robin Roger Peller, Design Atelier  
AEG Turbine Factory: courtesy Siemens  
First Church of Christ, Scientist: © Wayne Andrews/ESTO  
Pennsylvania Station: courtesy Library of Congress  
Robie House: courtesy Library of Congress  
New York Public Library Main Branch: courtesy New York Public Library  
Casa Milà: courtesy Fundació Catalunya La Pedrera  
Grand Central Terminal: courtesy Library of Congress

### Page 104

Woolworth Building: courtesy Library of Congress  
American Radiator Building: courtesy Bryant Park Hotel  
Schröder House: © Ernst Moritz/Centraal Museum  
Lovell Beach House: courtesy Library of Congress  
Bauhaus Building: © Christin Irrgang/Bauhaus Dessau Foundation  
Stockholm Public Library: courtesy City of Stockholm  
Ford River Rouge Complex: © Charles Sheeler/Lane Collection/Metropolitan Museum of Art/Art Resource, NY  
Lovell Health House: courtesy Architectural Record

### Page 105

Barcelona Pavilion: © Pete Sieger  
Viceroy's House: courtesy Christian Haugen/Creative Commons  
Chrysler Building: courtesy Library of Congress  
Kiefhoek Housing: courtesy State Service for Cultural Heritage (Netherlands)  
Empire State Building: courtesy Library of Congress  
Villa Savoye: Paul Kozlowski/© Fondation Le Corbusier/Artists Rights Society  
Aluminaire House: courtesy Michael Schwarting  
Maison de Verre: © Mark Lyons  
PSFS Building: courtesy Hagley Museum and Library

### Page 106

Paimio Sanatorium: © Flickr user Leon/Creative Commons  
Fallingwater: courtesy Library of Congress  
Rockefeller Center: © David Shankbone/Creative Commons  
Johnson Wax Building: courtesy Library of Congress  
Crow Island School: © Hedrich Blessing  
Casa Luis Barragán: © Casa Luis Barragán 1947, property of Gobierno del Estado de Jalisco and Fundación de Arquitectura Tapatía Luis Barragán A.C.  
Glass House: © Peter Aaron, courtesy Glass House  
Eames House: © Julius Shulman, courtesy J. Paul Getty Trust, Getty Research Institute, Los Angeles

### Page 107

Farnsworth House: courtesy Library of Congress  
Unité d'Habitation: Paul Kozlowski/© Fondation Le Corbusier/Artists Rights Society  
Lever House: © Florian Holzherr/SOM  
United Nations Headquarters: courtesy Library of Congress  
Säynätsalo Town Hall: © Jonathan Rieke  
Chapelle Notre Dame du Haut: Paul Kozlowski/© Fondation Le Corbusier/Artists Rights Society  
Seagram Building: © Ezra Stoller/ESTO  
Solomon R. Guggenheim Museum: © David Heald/Solomon R. Guggenheim Foundation, New York

### Page 108

National Congress Building: © Andreas Kornfeld/ESTO  
Trans World Airlines (TWA) Terminal: courtesy Library of Congress  
Berlin Philharmonic Concert Hall: © Manfred Brückels/Creative Commons  
Yale Art and Architecture Building: © Ezra Stoller/ESTO  
Vanna Venturi House: courtesy VSBA Architects

Yoyogi National Gymnasium: © Wikimedia user Rs1421/Creative Commons

### Page 109

Marina City: courtesy Geoffery Goldberg  
Habitat 67: © Timothy Hursley/courtesy Safdie Architects  
Whitney Museum of American Art: courtesy the Metropolitan Museum of Art/Ed Lederman  
National Center for Atmospheric Research: © Ezra Stoller/ESTO  
Ford Foundation Building: © Ezra Stoller/ESTO  
Salk Institute for Biological Studies: courtesy Salk Institute for Biological Studies  
Montreal Biosphere: © Leo Gonzales/Creative Commons

### Page 110

Gwathmey Residence and Studio: © Scott Frances/OTTO  
San Cataldo Cemetery: © Maria Lucia Lucetti & Paolo Tedeschi/courtesy Visit Modena  
Munich Olympic Stadium: courtesy Olympiapark München  
Kimbell Art Museum: courtesy Library of Congress  
Centraal Beheer: courtesy Architectuurstudio  
Herman Hertzberger  
Sydney Opera House: © Flickr user Simone Brunozzi/Creative Commons  
Museo di Castelvecchio: © Flickr user Leon/Creative Commons  
Centre Georges Pompidou: © Denancé Michel/courtesy Renzo Piano Building Workshop

### Page 111

Gehry Residence: © Tim Street-Porter  
Thornycrown Chapel: © Randall Connaughton/courtesy Thornycrown Chapel  
Sangath: courtesy Vastushilpa Foundation  
Vietnam Veterans Memorial: courtesy National Park Service  
National Assembly Building of Bangladesh: © Nahid Sultan & Saiful Aouf/Creative Commons  
SESC Pompéia: © Pedro Kok  
Neue Staatsgalerie: © Wikimedia user Jaimrsilva/Creative Commons  
National Museum of Roman Art: © Guzmán Lozano/Creative Commons

### Page 112

Menil Collection: © Piano & Fitzgerald/courtesy Fondazione Renzo Piano  
Church of the Light: courtesy Tadao Ando Architect & Associates  
Therme Vals: © Global Image Creation, courtesy 7132 Hotel and Vals  
Guggenheim Museum Bilbao: © David M. Heald/Solomon R. Guggenheim Foundation, New York  
Kaze-no-Oka Crematorium: © Toshiharu Kitajima/courtesy Maki and Associates  
Zubizuri Bridge: © Tony Hisgett/Creative Commons  
Jewish Museum: © Bitter Bredt Fotografie/courtesy Studio Libeskind  
Petronas Towers: © Jeff Goldberg/ESTO

### Page 113

Gallery of Horyuji Treasures: © Wikimedia user Kakidai/Creative Commons  
Diamond Ranch High School: © Kim Zwarts  
Tate Modern I and II: © Iwan Baan/courtesy Herzog & de Meuron Basel  
KKL Luzern: courtesy KKL Luzern, Switzerland  
Sendai Mediatheque: courtesy Sendai Mediatheque  
Jubilee Church: © Scott Frances/OTTO  
30 St Mary Axe: © Nigel Young/Foster + Partners

### Page 114

21st Century Museum of Contemporary Art: courtesy Open Image Data of Kanazawa City  
Memorial to the Murdered Jews of Europe: © Roland Halbe  
Millau Viaduct: © Jean Philippe Arles, courtesy Foster + Partners  
Seattle Central Library: © Philippe Ruault, courtesy OMA  
Chichu Art Museum: courtesy Tadao Ando Architect & Associates  
Madrid Barajas International Airport, Terminal 4: © Jean-Pierre Dalbéra/Creative Commons  
Apple Store, 5th Avenue: © Peter Aaron, courtesy Bohlin Cywinski Jackson

### Page 115

Casa da Musica: © Philippe Ruault, courtesy OMA  
Olympic Sculpture Park: © Benjamin Benschneider, courtesy Seattle Art Museum

BMW Welt: © Duccio Malagamba, courtesy Coop Himmelb(l)au  
Oslo Opera House: © Erik Berg, courtesy Den Norske Opera & Ballett  
Limoges Concert Hall: courtesy Bernard Tschumi Architects  
Ningbo Historic Museum: © Wikimedia user Siyuwji/Creative Commons

### Page 116

Iberé Camargo Foundation: © Felipe Neves/Creative Commons  
Cathedral of Christ the Light: © Cesar Rubio, courtesy SOM  
Beijing Capital International Airport, Terminal 3: © Nigel Young/Foster + Partners  
Neues Museum: © Ute Zscharnt/courtesy David Chipperfield Architects  
Herring Center of the Arts: © Thomas Mayer, courtesy Steven Holl Architects  
MAXXI National Museum of XXI Century Arts: © Iwan Baan

### Page 117

Aqua Tower: © Stephen Hall/Hedrich Blessing, courtesy Studio Gang  
North Carolina Museum of Art: courtesy North Carolina Museum of Art  
Burj Khalifa: courtesy SOM/© Nick Merrick/Hedrich Blessing  
Poetry Foundation: © Steven Hall/Hedrich Blessing, courtesy John Ronan Architects  
International Commerce Centre: © Tim Griffith, courtesy KPF  
Barnes Foundation: © Tom Crane, courtesy Barnes Foundation  
CCTV Headquarters: © Ian A Holton/Creative Commons

### Page 118

Heydar Aliyev Centre: © Helene Binet, courtesy Zaha Hadid Architects  
Shenzen Bao'an International Airport, Terminal 3: courtesy Archivo Fuksas/Studio Fuksas  
Novartis Building 337: courtesy Rafael Viñoly Architects  
GL Events Headquarters: © Studio Odile Decq/Roland Halbe  
The High Line: © Studio Dubuisson  
Matmut Atlantique Stadium: courtesy Herzog & de Meuron Basel  
Shanghai Tower: courtesy Gensler

### Page 119

Palais Stoclet: © Jean-Pol Grandmont/Creative Commons  
Einstein Tower: © R. Arlt, courtesy Leibniz Institute for Astrophysics Potsdam  
Schindler House: © Joshua White/MAK Center  
Notre-Dame du Raincy, Architectural Record  
Rusakov Workers' Club: © Sovfoto/Getty

### Page 120

Kingswood School Cranbrook: © Wayne Andrews/ESTO  
E1027: courtesy Cap Moderne  
Open-Air School: © Rory Hyde/Creative Commons  
Van Nelle Factory: © Architectural Record  
De Bijenkorf Store: courtesy KLM Aerocarto

### Page 121

The Triple Bridge: © Tim Draper/Getty  
Casa del Fascio: © Wikimedia user Pinotto992/Creative Commons  
Kröller-Müller Museum: courtesy Archive Kröller-Müller Museum, Otterlo, Netherlands  
Church of Saint Francis of Assisi: © Andrea Pistolesi/Getty  
Il Girasole: © Michael Waters

### Page 122

The Chemosphere: © Denis Freppel/ESTO  
Frey House II: © Andrea Rugg  
Shrine of the Book: © Ezra Stoller/ESTO  
St. Catherine's College: © Daniel Hopkinson/Hodder + Partners  
Church of St. Peter: © Anders Clausson/sanktpetrikyrka.se

### Page 123

Gallaratese Housing: © Marloes Faber  
Bagsværd Church: © Seier + Seier/Creative Commons  
Santa Maria Church: © View Pictures/Getty  
Jean-Marie Tjibaou Cultural Center: © ADCK/Centre Culturel Tjibaou/Renzo Piano Building Workshop  
Yokohama International Passenger Terminal: © Satoru Mishima/Farshid Moussavi Architecture

### Page 124

Crystal Palace: courtesy Victoria and Albert Museum  
Centre Georges Pompidou: © Denancé Michel/courtesy Renzo Piano Building Workshop

### Page 125

Fallingwater: courtesy Library of Congress  
Villa Savoye: Paul Kozlowski/© Fondation Le Corbusier/Artists Rights Society  
Lakofski House: courtesy Denise Scott Brown  
Shosoin Treasure House: © Wikimedia user Moja/Creative Commons

### Page 126

Mosque-Cathedral of Córdoba: © Pixabay user Salao228/Creative Commons  
Municipal Orphanage: © Gerard Dukker/courtesy State Service for Cultural Heritage (Netherlands)

### Page 127

Dome of the Florence Cathedral: © Petar Milosevic/Creative Commons  
Chapelle Notre Dame du Haut: Paul Kozlowski/© Fondation Le Corbusier/Artists Rights Society  
Cabanon de Vacances: Olivier Martin-Gambier/© Fondation Le Corbusier/Artists Rights Society

### Page 128

World's Columbian Exposition of 1893: courtesy Project Gutenberg eBook of Official Views of the World's Columbian Exposition  
Larkin Building: courtesy Collection of the Buffalo History Museum  
Imperial Hotel: courtesy Frank Lloyd Wright Trust

### Page 129

Midway Gardens: courtesy Lake County (IL) Discovery Museum, Curt Teich Postcard Archives  
Madison Square Garden: courtesy Art and Picture Collection, New York Public Library  
Madison Square Presbyterian Church: courtesy Art and Picture Collection, New York Public Library  
Pennsylvania Station: courtesy Library of Congress  
Low House: courtesy Library of Congress  
Dodge House: courtesy Library of Congress

### Page 130

Singer Building: courtesy Art and Picture Collection, New York Public Library  
Schiller Theater Building: courtesy Library of Congress  
Chicago Stock Exchange: courtesy Library of Congress  
Masonic Temple: courtesy University of Illinois Press  
Richfield Tower: courtesy Library of Congress  
Riverview High School: courtesy World Monuments Fund  
American Federation of Labor Medical Services Building: © John Ebsel/Keith De Lillis Gallery/University of Pennsylvania School of Design  
Orinda House: courtesy Morley Baer

### Page 131

Two Columbus Circle: Architectural Record  
New Haven Coliseum: courtesy New Haven Historical Society  
Addition to the Observatory Dining Hall at the University of Virginia: courtesy Robert A.M. Stern Architects  
House III: courtesy Eisenman Architects  
Bronx Development Center: © Ezra Stoller/ESTO  
American Folk Art Museum: © Giles Ashford, courtesy Tod Williams Billie Tsien Architects | Partners  
Luna Park: courtesy Library of Congress  
Stardust Resort and Casino: courtesy University of Nevada, Las Vegas, Special Collections



*my* **CLEAR** **opinion**™

**SIGN UP  
TODAY**

**We're searching for experts like you.**  
Share your industry insight, earn CLEARcash™.

What is CLEARcash™? ▶▶

*What is  
CLEARcash?*

100  
points of CLEARcash™

=

\$1



500pts



Minimum balance  
of 500 points to  
redeem gift card.



Points are paid out  
automatically once a month  
as long as they meet the  
minimum balance.

**SIGN UP  
TODAY**



Every survey invitation will list the amount of  
CLEARcash™ points that will be rewarded  
upon completion.



## New and Upcoming Exhibitions

### Timber City

Washington, D.C.

September 17, 2016–May 21, 2017

This new exhibition at the National Building Museum will challenge the notion that wood is an antiquated building material, demonstrating the wide range of benefits offered by cutting-edge methods of timber construction, including surprising strength, fire resistance, sustainability, and beauty. Curated and designed by Yugon Kim and Tomomi Itakura, founding partners of the Boston-based architectural design firm ikd, the exhibit will examine the recent boom in timber construction worldwide and highlight U.S.-based projects, including the two competition winners of the recent Tall Wood Building Prize, sponsored by the U.S. Department of Agriculture. Visit [nbm.org](http://nbm.org).

### Tracing Displacement and Shelter

New York City

October 1, 2016–January 22, 2017

This upcoming exhibit at MoMA will explore how architects and designers have considered the meaning of shelter in light of global refugee emergencies. Works on display will examine such trends as the strengthening of national borders in response to influxes of migrants and the growing need for affordable, adaptable mobile housing for transient populations (currently estimated at over 60 million). For more information, visit [moma.org](http://moma.org).

## Ongoing Exhibitions

### Roberto Burle Marx: Brazilian Modernist

New York City

Through September 18, 2016

The Brazilian artist and landscape architect Roberto Burle Marx (1909–94) undertook projects ranging from the mosaic pavements on the seaside avenue of Rio de Janeiro's Copacabana Beach to the multitude of gardens that embellish Brasilia (one of several large-scale projects he executed in collaboration with famed architect Oscar Niemeyer). This exhibition at the Jewish Museum explores the richness and breadth of the artist's practice—from landscape architecture to painting, sculpture, theater design, tapestries, and jewelry. Visit [thejewishmuseum.org](http://thejewishmuseum.org).

### Fast Forward: The Architecture of

#### William F. Cody

Los Angeles

Through September 25, 2016

William F. Cody's architectural practice was

prolific and diversified, and engaged a celebrity clientele that included Walt Disney, Frank Sinatra, and Bing Crosby. His projects ranged from residential homes and condominiums to commercial centers, industrial complexes, and city and community master-planning. Although a majority of Cody's built work was concentrated in California and Arizona, he had commissions in Texas, Nevada, Colorado, Hawaii, Mexico, Honduras, and Cuba. This exhibition is the first comprehensive overview of Cody's architecture based on primary archival research. It is a tribute to one of the "giants" of the midcentury modern movement and celebrates Cody's centennial. Visit [aplusd.org](http://aplusd.org).

### Narcissus Garden at Johnson's Glass House

New Canaan, Connecticut

Through November 30, 2016

To celebrate the 110th anniversary of the great architect's birth and the 10th anniversary of the opening of his most famous residence to the public, Philip Johnson's Glass House hosts an installation by Japanese artist Yayoi Kusama. *Narcissus Garden*, initially created for the 33rd Venice Art Biennale in 1966, has been incorporated into the 49-acre site around the Glass House. The piece consists of 1,300 steel spheres floating on a newly restored pond, providing a dramatic view leading up to the house. For more information, visit [theglasshouse.org](http://theglasshouse.org).

### Oskar Hansen: Open Form

New Haven, Connecticut

Through December 17, 2016

*Oskar Hansen: Open Form* traces the evolution of Hansen's theory of open form from its origin in his own architectural projects to its application in film, visual games, and other artistic practices. Hansen was a member of Team 10, the architectural group that formed the first critical voice against the modernist orthodoxy of the Athens Charter and the followers of Le Corbusier. In his open-form theory, Hansen proposed parting ways with the model of the all-knowing expert and advocated for the participation and change in hierarchy between an artist and viewer. The exhibition, at the Yale School of Architecture, is divided into seven sections exploring Hansen's theories. For more information, visit [architecture.yale.edu](http://architecture.yale.edu).

### Model Behavior: Snøhetta at SFMOMA

San Francisco

Through January 14, 2017

This exhibition explores the design process behind Snøhetta's expansion of the San Francisco Museum of Modern Art. Architectural models, sketches, an interactive app, and a narrated walk-through of the building reveal

how Snøhetta responded to the built environment and cultural context of the expansion-to-be and arrived at the space that opened on May 14 of this year. At SFMOMA. For more information, visit [sfmoma.org](http://sfmoma.org)

## Lectures, Conferences, and Symposia

### Maison&Objet

Paris

September 2–6, 2016

This biannual lifestyle show at the Paris-Nord Villepinte Convention Centre will highlight the offerings of more than 3,000 brands in decoration, design, furniture, accessories, textiles, fragrances, and tableware for luxury retail, interior design, and architecture. For more information, visit [maison-objet.com](http://maison-objet.com).

### Post-Brexit: Creating the Future

London

September 7, 2016

*Post-Brexit: Creating the Future*, which aims to stimulate discussion about how a new era in British creativity can be started post-Brexit, is hosted by the design and planning coalition New Narratives. The event will feature a series of short talks by architects, designers, and artists, followed by an open discussion in which all attendees will be encouraged to participate. Speakers at the event include Patrik Schumacher, director of Zaha Hadid Architects; John McRae of Orms; and art advisor Manick Govinda. Visit [newnarratives.co.uk](http://newnarratives.co.uk).

### London Design Festival 2016

London

September 17–25, 2016

First staged in 2003, the London Design Festival has since become one of the world's largest conferences for design of all kinds, ranging from interiors to that of the city. This year's festival, oriented around the theme "design is in the detail," will feature experiments such as a wide wooden structure by Allison Brooks Architects called *The Smile*, an installation about contemporary urban living presented by MINI, and numerous partnership events, networking opportunities, and panels on trends in engineering and design. For more information, visit [londonfestival.com](http://londonfestival.com).

### Cersaie 2016

Bologna, Italy

September 26–30, 2016

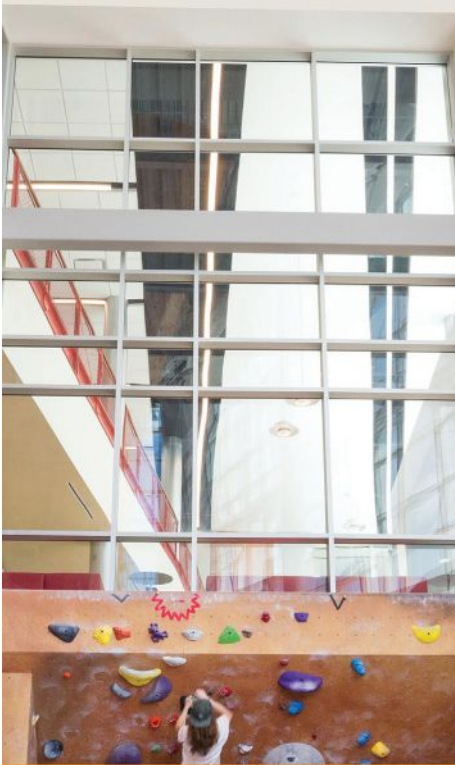
The annual international exhibition of ceramic tile and bathroom furnishings, held at the Bologna Exhibition Center, will feature Lord

Fire and Nice.

aluflam

**Fire-Rated Aluminum  
Window And Door  
Systems**

For beauty, the best in safety and design flexibility look to Aluflam. Built to blend effortlessly with non-rated storefront and curtain wall systems, our virtually limitless portfolio includes true extruded aluminum vision doors, windows and glazed walls fire-rated for up to 120 minutes. You'll see why we've become the favorite of architects and installers alike. Aluflam gives you a barrier to fire, not inspiration.



Aluflam USA  
Phone 562-926-9520 | Fax 562-404-1394  
Email [info@aluflam-usa.com](mailto:info@aluflam-usa.com)  
[www.aluflam-usa.com](http://www.aluflam-usa.com)

## dates&events

Norman Foster, who will give the keynote address on Tuesday, September 27. The trade show will highlight the latest architectural and interiors products and innovations of more than 900 exhibitors from nearly 35 countries, and include additional materials such as marble, natural stone, and wood. Visit [cersaie.it](http://cersaie.it).

### Archtober 2016

New York City

October 1–31, 2016

Archtober is New York City's Architecture and Design Month, the sixth annual festival of architecture activities, programs, and exhibitions taking place during the month of October. It presents special tours, lectures, films, and exhibitions that focus on the importance of architecture and design in everyday life. The many participating organizations aim to raise awareness of the important role of design in New York and to build a lasting civic and international recognition of the richness of its built environment. For more information, visit [archtober.org](http://archtober.org)

### International Bauhaus Colloquium

Weimar, Germany

October 26–29, 2016

The 13th International Bauhaus Colloquium at the Bauhaus-Universität Weimar is titled *Dust and Data*. It will reflect on the near century-long history of the Bauhaus at its original sites in Germany—Weimar, Dessau, and Berlin—as well as the history of its international reception. Just as in the Bauhaus and post-Bauhaus years, architecture is again entangled in geopolitical transformations on a global stage. The conference, through the lens of architectural history and methods, will address contemporary political transformations including migration, climate change, and violent conflict. Visit [bauhauskolloquium.de](http://bauhauskolloquium.de).

### Women in Architecture Forum & Awards

New York City

November 2, 2016

RECORD will present the magazine's third annual awards program to recognize and promote women's design leadership. The afternoon symposium will be followed by a reception honoring this year's award winners in five categories: design leader, new-generation leader, innovator, activist, and educator or mentor. Visit [arwomeninarchitecture.com](http://arwomeninarchitecture.com).

### Architectural Record Innovation Conference East

New York City

November 3, 2016

Join RECORD for a single-day conference on architecture and making in the post-digital

age. Innovation East (the East Coast counterpart to the summer's conference in San Francisco) will bring together imaginative and forward-looking figures to exchange ideas about the built world of today and the future. Speakers and participants will range from architects practicing outside the discipline to principals of large firms, and from materials experts to graphic designers. Attendees will leave the conference inspired by brave and original approaches to some of the most relevant problems in the industry. For more information, visit [ariceast.com](http://ariceast.com).

### NeoCon East

Philadelphia

November 9–10, 2016

NeoCon East, a design expo and conference for commercial interiors on the East Coast, will return to Philadelphia for its 14th edition. This year's NeoCon East will feature partnerships with a host of regional design organizations, as well as current products and services—ready to specify—across a spectrum of vertical markets. Visit [neoconeast.com](http://neoconeast.com)

### World Architecture Festival 2016

Berlin

November 16–18, 2016

This year's World Architecture Festival, in addition to awarding prizes for building projects both completed and proposed, will include a robust roster of seminar speakers—including Richard Rogers and Moshe Safdie—who will touch on large-scale topics relating to housing: housing in dense cities, housing for refugees, housing and luxury, housing and energy efficiency, and more. There will also be panels focused specifically on the revitalization of post-Wall Berlin and architecture tours of the area running on all three days of the festival. Additionally, there will be on-site "live crits," where architects and designers can receive feedback on their project ideas in real time. Visit [worldarchitecturefestival.com](http://worldarchitecturefestival.com).

## Competitions

### AIANY COTE Awards 2016

Submission deadline: September 16, 2016

Established in 2014 by the New York chapter of the AIA's Committee on the Environment, this awards program recognizes results-oriented projects that are socially and environmentally responsible, promote sustainable design in the urban context, and reveal the process behind innovation. Visit [aianycoteawards.org](http://aianycoteawards.org).

### Death & the City: Tokyo Vertical Cemetery

Registration deadline: September 23, 2016

In the Shinjuku district of Tokyo, architectural research group arch out loud challenges design-

ers to develop proposals for a vertical cemetery that explores the relationship between life and death within the city. Examining this condition can afford designers the opportunity not just to efficiently respond to the issue of space but also to look into the cultural identity that this program can project. For more information, visit [archoutloud.com](http://archoutloud.com).

#### **Fentress Challenge: Airport of the Future**

*Submission deadline: October 1, 2016*

Students who enter this contest, sponsored and judged by Fentress Architects, must submit a design for the airport terminal of the future, specifically one that responds to present-day issues and dynamics in airport design and air travel. Designs ought to be flexible and consider security while also responding to long-term trends like globalization and urbanization. A traveler's curbside-to-airside experience is also a major consideration. Winners will receive cash prizes and a paid fellowship, as well as international exposure. Visit [fentressarchitects.com](http://fentressarchitects.com).

#### **Architecture at Zero 2016**

*Registration deadline: October 28, 2016*

The competition challenge is to create a net zero energy student housing project at the San Francisco State University campus. The competition has two components. First, entrants will create an overall site plan to accommodate the 784 housing units, student services, dining center, child-care facility, and parking, detailed in the Challenge Program. Second, entrants will design one building, in detail, to indicate net zero energy performance. The competition is open to students, architects, landscape architects, urban planners, engineers, and designers anywhere in the world. Up to \$25,000 will be awarded to student and professional winners. Visit [architectureatzero.com](http://architectureatzero.com)

#### **Laka Competition '16: Architecture that Reacts**

*Submission deadline: November 1, 2016*

The architecture organization Laka invites designers from around the world to submit ideas for architecture that can dynamically respond to current needs and circumstances, focusing on designs that are socially engaged and capable of reacting to unpredictable conditions and environmental, natural, and social risks. Proposals should constitute an ideological interpretation of modern technological solutions, taking into consideration social and economic determinants. They should promote social revitalization and increased safety and freedom for their users. For more information, visit [lakareacts.com](http://lakareacts.com).

#### **eVolo 2017 Skyscraper Competition**

*Registration deadline: January 24, 2017*

Established in 2006, the annual Skyscraper Competition recognizes outstanding ideas that redefine skyscraper design through the implementation of novel technologies, materials, programs, aesthetics, and spatial organizations along with studies on globalization, flexibility, adaptability, and the digital revolution. The competition is an investigation of public and

private space and the role of the individual and the collective in the creation of a dynamic and adaptive vertical community. There are no restrictions in regard to site, program, or size. For more information, visit [evolo.us](http://evolo.us).

*E-mail information two months in advance to [recordevents@bnpmedia.com](mailto:recordevents@bnpmedia.com).*

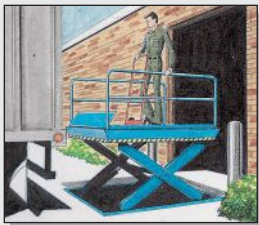


The University Of Kansas Department of Architecture invites applications for Studio 804, a comprehensive one-year, fully hands-on design-build experience for students who are at an advanced stage in their studies and committed to the continued research and development of affordable, sustainable and inventive building solutions. Students enrolled in Studio 804 work full time to design and build a new building every year. The widely-published program, under the direction of Distinguished Professor Dan Rockhill, has produced nine LEED Platinum buildings, three of which are Passive House-certified. To learn more, visit [studio804.com](http://studio804.com) and [architecture.ku.edu/studio804](http://architecture.ku.edu/studio804). We accept transfers, 4+2 grads, B.Arch grads, M.Arch grads, or professionals — anyone who wants to be a better architect by having had the experience of designing and constructing a sophisticated building in its entirety from the ground up.

**STUDIO804.COM**



## DISAPPEARING DOCK LIFT



**NOW YOU SEE IT**



**NOW YOU DON'T**

***AN ADVANCE DOCK LIFT IS THE ONLY EQUIPMENT THAT CAN SERVICE ALL TRUCKS.***

- **WHITE PAPER (SELECTION GUIDE)**
- **LIFT SPECIFICATIONS SHEETS**
- **ARCHITECTURAL SPECIFICATIONS**
  - **PIT & PAD DRAWINGS**

**AVAILABLE AT [ADVANCELIFTS.COM](http://ADVANCELIFTS.COM)**



**ISO 9001:2008  
Certified**



**1-800-843-3625**

CIRCLE 1

**Architectural Record**  
is always a click away.



**ARCHITECTURAL  
RECORD**  
Have you connected?



# Feeling inspired?

Introducing the next big thing in lighting! B-K Lighting gives you complete control to match your environment at your fingertips. The INSPIRATION Control System™ iOS® App enables control of B-K Lighting's Bluetooth® Wireless Technology featuring BKSSL® Power of 'e' with Adjust-e-Lume® Nite Star™ and Power of C™ with Color Tuning Technology Denali Series™ floodlights.



**Inspiration** in the palm of your hand!



**B-K LIGHTING**.com

CIRCLE 2



THE SKYSCRAPER MUSEUM

For exhibitions and programs:  
[www.skyscraper.org](http://www.skyscraper.org)

39 Battery Place, NY, NY 10280 | Wed.-Sun., 12-6

CIRCLE 15

**HEADWATERS**  
 RESOURCES

**DELIVERING SUSTAINABLE SOLUTIONS**

After water, concrete is one of the most sustainable and widely used materials in the world.

Fly ash plays an important role in increasing the sustainability of concrete. Headwaters Resources is the nation's leader in supplying quality fly ash. We can help you discover how to improve the performance of your concrete while simultaneously improving its environmental profile.

Visit [www.flyash.com](http://www.flyash.com) for answers to the most common questions about fly ash. You can also contact your expert Headwaters Resources technical support representative for advice on your specific sustainability opportunities.

[www.flyash.com](http://www.flyash.com)

CIRCLE 78

**HEATHER + LITTLE LTD**

*Custom Architectural Sheet Metal Fabrications*

At H&L we fabricate and reproduce custom ornamental sheet metal, from complex ceiling panels to decorative details; custom finials to intricate cornices. Our master metal smiths are experts in historic reproduction and custom design-build projects.

*San Francisco City Hall, Dome Restoration*

call 1.800.450.0659 email [info@heatherandlittle.com](mailto:info@heatherandlittle.com) [www.heatherandlittle.com](http://www.heatherandlittle.com)

CIRCLE 61

Quality Dryer Vent for your  
 "Special Project"

**NEW!**

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

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

**Aluminum Dryer Vent**

with Heavy Duty 8 1/2" Long Aluminum Pipe

Find out more at [www.seiho.com](http://www.seiho.com) or call 800-248-0030

CIRCLE 14

ARCHITECTURAL  
RECORD 125 years

# #1 PROVIDER of CEUs TO THE INDUSTRY



In 2015, *Architectural Record's* parent company BNP Media, offered 89,590 hours of AIA CE credits. That's more than the 2nd and 3rd providers combined!

## AIA CE CREDIT HOURS

**89,590**



**Architectural Record/  
BNP Media**

70,106\*



#2 Provider +  
#3 Provider

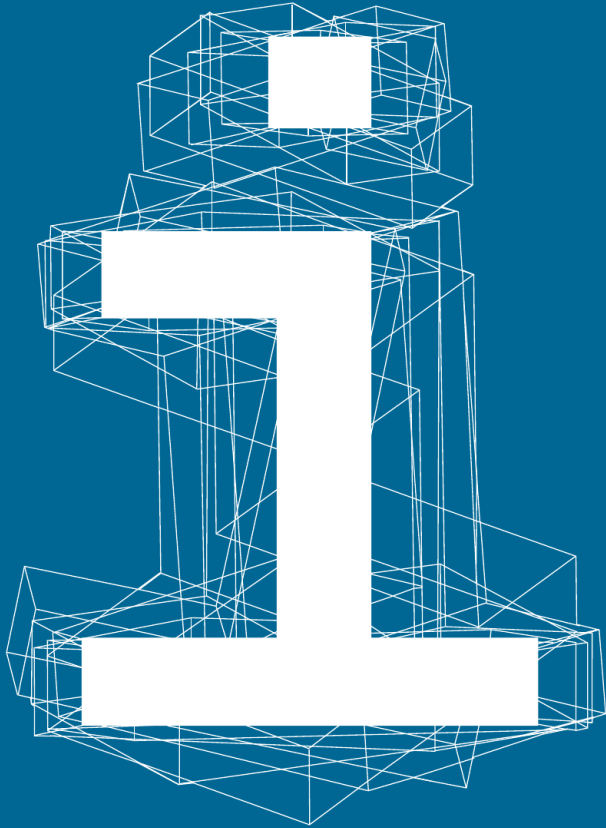
Data provided by AIA, presented to 2016 AIA Convention attendees.

*Architectural Record's* library of courses is best in class!  
Visit the CE Center and earn your credits today!

**[www.ce.architecturalrecord.com](http://www.ce.architecturalrecord.com)**

ARCHITECTURAL  
RECORD

# INNOVATION CONFERENCE



CREATIVITY+DESIGN+TECHNOLOGY

ARCHITECTURE  
AND MAKING IN THE  
POST-DIGITAL AGE



SUPER EARLY BIRD RATES END SEPT. 9!  
[WWW.ARINNOVATIONCONFERENCE.COM](http://WWW.ARINNOVATIONCONFERENCE.COM)

NOVEMBER 3 | NEW YORK CITY

KEY CORPORATE SPONSORS

GUARDIAN  
INDUSTRIES

reTHINK  
**WOOD**



PRODUCT GALLERY SPONSORS

ABC  
STONE

**DORMA**

Contact.



menck  
windows

Ornamental Metal Institute of New York

Steel Institute of New York

**RISING ABOVE** a gritty swath of rail lines leading to and from the Porta Garibaldi Station in Milan, an eye-catching urban landmark has made another comeback from a state of disrepair. Studio Original Designers 6R5 Network, an almost 50-year-old local firm, joined forces with five partner companies, as well as the city council and Italian railway authorities, to restore vibrant tile-work to the hourglass-shaped Torre Arcobaleno. The firm first revitalized the water tower in 1990, when Milan hosted the 14th FIFA World Cup, by adding colorful tile. It was an “old, worn, and ugly industrial artifact,” says executive associate Francesco Roggero, originally made of plain concrete and dating back to 1964. “We turned it into a point of reference, a vivid element in the hectic and active community of Milan,” says Roggero. Returning to the project 25 years later, in time for Expo 2015, the studio and its collaborators cleaned, replaced, or repaired all of the Rainbow Tower’s 11,000-square-foot surface. At 115 feet tall, the structure is covered in some 100,000 4-inch-square ceramic tiles in 14 colors, creating a pattern, says the firm, that “fits in with the new, feverish activity of the area.” —Miriam Sitz





Ceiling design by **Hawkins\Brown**



**Round design, Surround cool**



## **Samsung System Air Conditioner 360 Cassette**

With its elegant circular design, it blends easily into any setting. 360° airflow ensures even, draft free cooling, reaching every corner of the room.

For more information, visit [samsung.com/business](http://samsung.com/business)

CIRCLE 76



**SAMSUNG**



## Modern throwback.

### **THE BOOMERANG CHAIR BY RICHARD NEUTRA.**

Designed in 1942 by the mid-century modern master, the Boomerang Chair plays well inside and out. And in any space. Thankfully, you won't find it in every catalog, but you will find it exclusively in our Neutra Furniture Collection.



vs-network.com  
info@vs-charlotte.com  
704.378.6500