The Architect's Newspaper

February/March 2020 | www.archpaper.com | @archpaper | $3.95

Third Annual Timber Issue:
The Future of Wood Design

Largest timber building in North America almost complete
page 10

Harvard GSD to host timber conference
page 11

Studio Visit: LEVER Architecture
page 12

Emerging Voices

Another crop of young talent from the U.S., Canada, and Mexico gets the spotlight in our annual partnership with the Architectural League of New York. See page 54.

BRUCE DAMONTE

New Geome*trees*

Meet the researchers who are shaping timber's high-tech future.

UCL DESIGN COMPUTATION LAB

Tall Tales

New ICC timber codes begin to be adopted around the United States.

In early 2019, the International Code Council (ICC) officially approved changes to building codes that permitted timber structures as tall as 270 feet or 18 stories, an increase from the previous maximum of 85 feet. Although the changes are slated to go into effect in 2021, a few cities and states in heavily forested regions of the U.S. either have already adopted the changes or are facing pressure to do so. Oregon and Washington State implemented the taller code regulations in 2019, and the city of Denver will adopt them in 2020, with California likely to follow this year.

Arguments in favor of making the changes cite both economic and environmental benefits. In California, for example, the resolution that proposed adjusting the regulations to the Office of the State Fire Marshal noted that "the increased construction of mass timber buildings in California can result in investment in California-based mass **continued on page 10**

Learning from Japanese Structural Design

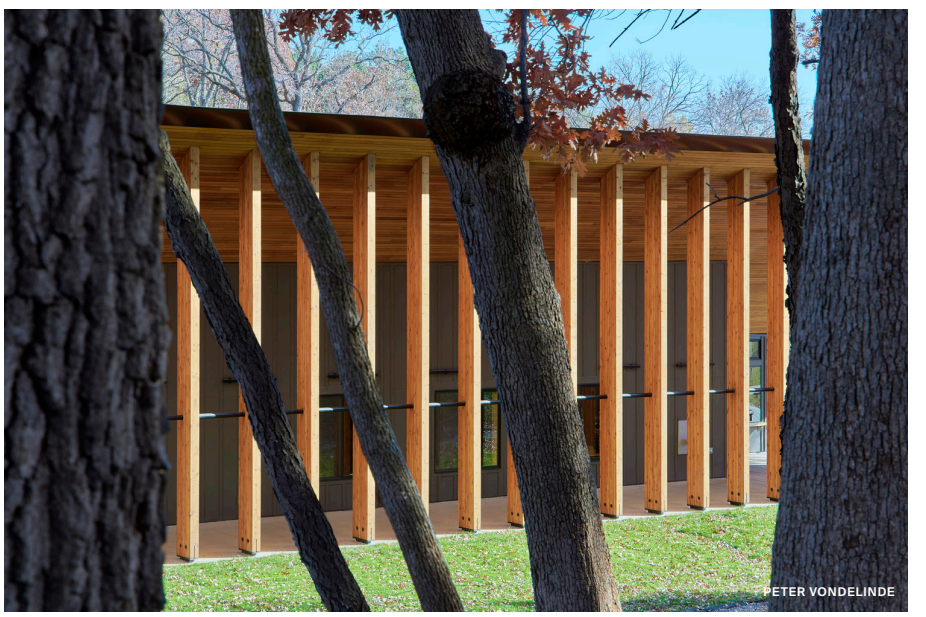
A review of Guy Nordenson's book.

KAWAGUCHI MAMORU/COURTESY KAWAGUCHI & ENGINEERS

Western architects' fascination with Japan is indisputable, a tendency most famously personified by none other than Frank Lloyd Wright. Contemporary practices are contributing to what is perhaps the third or fourth wave of Japanese influence on American architects, and this group was the focus of the 2016 Museum of Modern Art (MoMA) exhibition *A Japanese Constellation: Toyo Ito, SANAA, and Beyond*, organized by Pedro Gadanho and Phoebe Springstubb. There is something simple yet sophisticated in the examples of contemporary Japanese architecture selected for this exhibition—attributes one can trace to the synthetic nature of Japanese design itself.

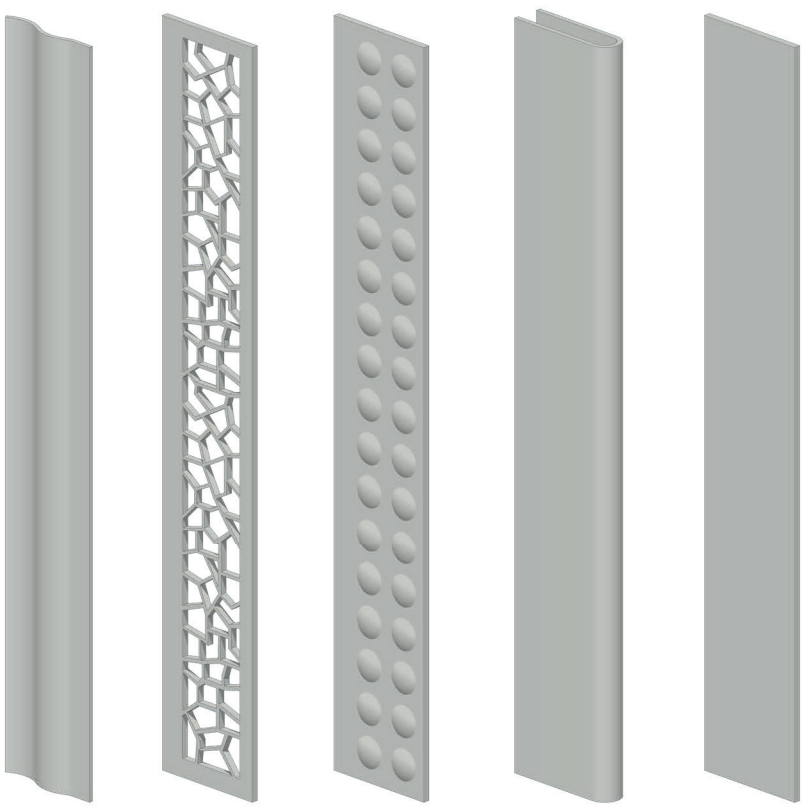
To accompany the exhibition, Guy Nordenson, a structural engineer and professor at Princeton's School of Architecture, organized a symposium that sought to delve more deeply into Japanese design from the vantage point of the structural engineers who have collaborated **continued on page 47**

2020 U.S. WoodWorks Wood Design Awards



PETER VONDELINDE

The Architect's Newspaper
21 Murray St., 5th Floor
New York, NY 10007



DESIGN FLEXIBILITY GOES OUTSIDE

Sunshades with CORIAN® SOLID SURFACE

When your design calls for more than just reducing solar heat and glare, Construction Specialties (CS) Sunshades with Corian® Solid Surface provide an architectural element that many facades lack. CS gives you a limitless spectrum of design possibilities.

Construction Specialties®

c-sgroup.com

WHERE CONRETE AND IMAGINATION MEET.

ROOF AND PLAZA PAVERS

PREST® PAVERS

HANOVER® PORCELAIN PAVERS

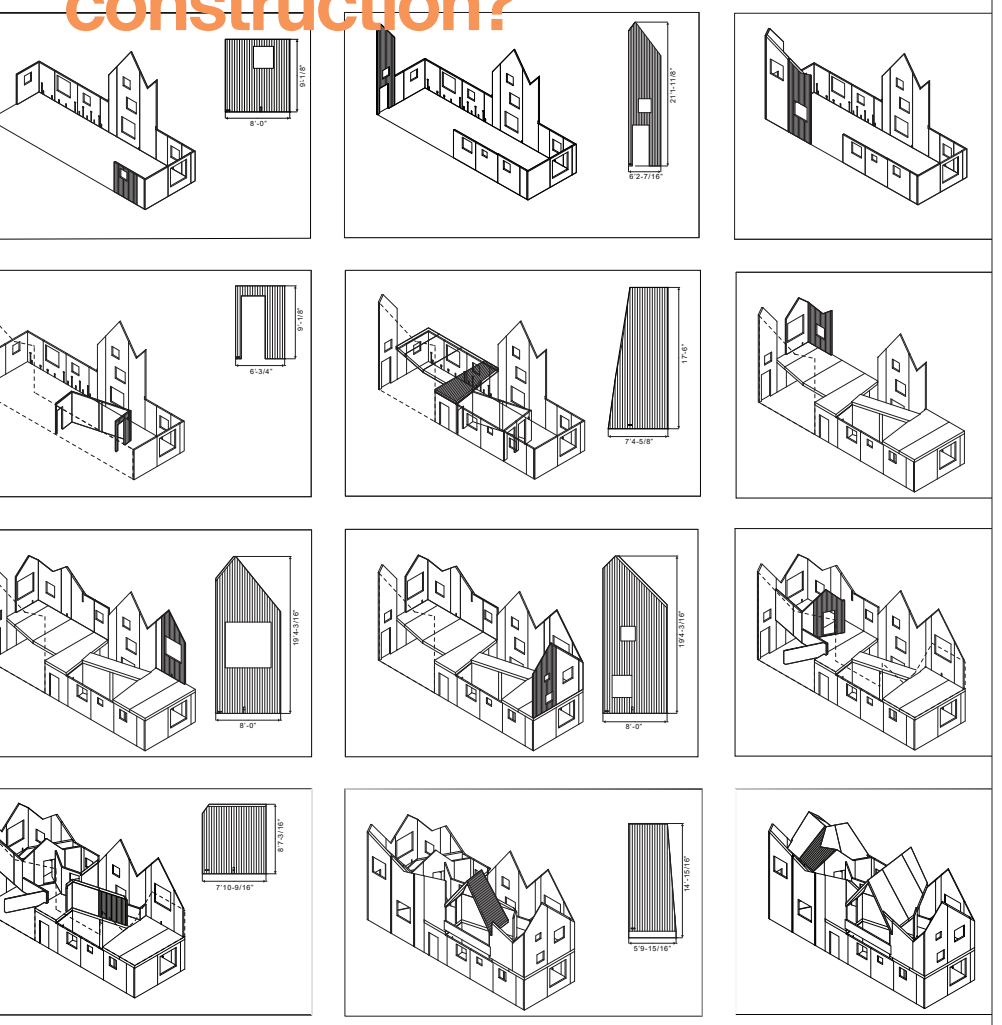
GUARDIAN® PAVER SYSTEM

Hanover® has participated in the development of concrete pavers for over 49 years, as they became an integral part of architectural design. From green roofs and rooftop pools to on-grade entrance ways and driveways, Hanover® can provide the highest quality unit paver for your next project.

HANOVER®
Architectural Products
www.hanoverpavers.com • 800.426.4242

Editors' Note

What's next for mass timber design and construction?



Since our last timber issue in January 2019 (the second annual), the mass timber industry has continued to carve out considerable space in the country's imagination. Prominent voices, including the architecture critic John King in the *San Francisco Chronicle* and New England forestry experts Frank Lowenstein, Brian Donahue, and David Foster in *The New York Times*, have been spreading the message: Wood construction, especially mass timber mid- and high-rises, signals an environmentally friendly path forward—and an aesthetically appealing one, too.

In response to this increased attention and advances in research (especially fire and seismic ratings), the International Code Council has adopted changes that will allow buildings of up to 18 stories [front page] to be built out of structural timber. As states such as Oregon, Washington, Utah, and California work to adopt these provisions even before they officially take effect in 2021, the American timber sector is bound to grow, and with that growth will come innovation. But there are still many questions about what this innovation will look like.

Much of the work around mass timber right now is focused on scaling up. For example, the largest mass timber building in America is under construction for a corporate client [page 10]. The project, designed by San Francisco–based firm WRNS, uses 345,000 square feet, or 2,400 tons, of CLT panels in a two-story building. Meanwhile, start-up Katerra is looking to vertically integrate timber design and building processes, having recently merged with Indian construction giant KEF Infra, and their ambitions are at the global scale.

These efforts are wholly productive, as increasing the output of engineered timber building products will allow for lower prices and further implementation by developers and institutions, as well as a significant sequestration of carbon and decrease in the use of energy-intensive concrete. These large, simple buildings are quick to erect and important for the broader timber movement.

In addition, the academic and design communities are beginning to address the mass timber question. In this issue, we continue our coverage of rapid changes in the industry and start to formulate what the future might look like for timber as advances in technology and aesthetics redefine wood architecture in the 21st century.

In our surveys of the latest practices and research in the past year, timber has become a big topic for designers as well as those working to push the limits of technology. ACADIA, SCI-Arc, and the Bartlett are among the bleeding-edge institutions proving the clear potential of timber. In our feature, we highlight four digital pioneers who are now turning their attention toward timber by incorporating AI and robotics, augmented reality, and automated assembly systems.

And at the Architectural Association in London, the newly founded Wood Lab has put out a call for research fellows to complete residencies at the school's Hooke Park woodland campus. They hope to produce research that will influence the rest of the work at the institution.

Architect Jennifer Bonner, who recently completed a CLT house in Atlanta [page 36], is organizing a symposium at Harvard GSD [page 11] that will attempt to chart a course for designing with mass timber. Organized with engineer Hanif Kara, the symposium will bring together engineers and other prominent design architects, such as Nader Tehrani and Ultramoderne, both of whom have completed mass timber projects recently.

In all, this issue shows how much interest there is from the architecture community in mass timber and points to directions the material and its surrounding discourse will be taking in the coming decades. The new ways in which we build with wood are only beginning to be developed. **Matt Shaw**

Masthead

Publisher
Diana Darling

Editor-in-Chief
William Menking

Executive Editor
Matt Shaw

Associate Publisher
Dionne Darling

Director of Operations
Matthew Hoffman

Special Projects Manager
Erica Hill

Managing Editor
Jack Balderrama Morley

Art Director
Ian Thomas

Web Editor
Jonathan Hilburg

Products Editor
Gabrielle Golenda

Interiors Editor
Adrian Madlener

Associate Editor
Sydney Franklin

Program Manager
Matthew Marani

Programming and Special Events Director
Susan Kramer

Events Marketing Managers
Charlotte Barnard
Erica Santiago

Graphics Manager
Sarah Hughes

Audience Development Manager
Ankit Rauniyar

Assistant Marketing Manager
Miguel Sanchez

Account Executives
Tony Fasano
Tara Newton

Ad Sales and Asset Management Assistant
Heather Peters

Media Marketing Assistant
Shabnam Zia

Conference Audience Assistant
Sue Ann Baker

Graphic Designer
Kailee McDade

Editorial Interns
Emma Natanzon
Shawn Simmons

General Information: info@archpaper.com
Editorial: editors@archpaper.com
Advertising: ddarling@archpaper.com
Subscription: subscribe@archpaper.com
Reprints: reprints@parsintl.com

Vol. 18, Issue 2 | February/March 2020

The Architect's Newspaper (ISSN 1552-8081) is published 8 times per year by The Architect's Newspaper, LLC, 21 Murray St., 5th Fl., New York, NY 10007.

Presort-standard postage paid in New York, NY. Postmaster, send address change to: 21 Murray St., 5th Fl., New York, NY 10007.

For subscriber service: Call 212-966-0630 or fax 212-966-0633.

$3.95 a copy, $39.00/year; International $160.00/year; Institutional $149.00/year

Please notify us if you are receiving duplicate copies.

The views of our reviewers and columnists do not necessarily reflect those of the staff or advisers of The Architect's Newspaper.

Corrections

The article "Park Parts" in the October/November 2019 issue of *The Architect's Newspaper* mistakenly stated that the concrete arches of Gathering Place in Tulsa, Oklahoma, were fabricated in Broken Arrowhead, Oklahoma. They were fabricated in Broken Arrow, Oklahoma.

Dura Coat PRODUCTS

An Axalta Coating Systems Company

HIGH PERFORMANCE LIQUID COATINGS

DURAPON 70 SPRAY
AAMA 2605

7000XLP HIGH DURABILITY POLYSTER
AAMA 2604

5000CX STANDARD DURABILITY POLYSTER
AAMA 2603

DURAPON 70 COIL
AAMA 2605

Curtain Walls
DURAPON 70 SPRAY

Partitions and C eiling
Tile Frames
5000 CX SPRAY

Suncreens and Louvers
DURAPON 70 SPRAY

Aluminum
Composite Panels
DURAPON 70 COIL

Storefront
7000 XLP SPRAY

Signage
7000 XLP SPRAY

6 In Case You Missed It...

We corralled the top timber design stories gleaned from archpaper.com over the last year.

Studio Gang chosen to head massive O'Hare expansion

The City of Chicago has chosen Studio ORD, a joint venture of several companies, to design a $2.2 billion global terminal and concourse at O'Hare International Airport. The team consists of Chicago's own Studio Gang and the international firm Corgan, as well as Solomon Cordwell Buenz and STL Architects. The terminal will feature timber-clad interiors.

COURTESY STUDIO ORD

Paul Andersen and Paul Preissner to curate the United States Pavilion at the 2020 Venice Architecture Biennale

Paul Andersen and Paul Preissner of the University of Illinois at Chicago will curate the U.S. Pavilion for the 17th Venice Architecture Biennale. The duo intends to recontextualize the 1930s-era pavilion building in a new work entitled *American Framing*. Andersen and Preissner will build an inner pavilion that will explore the U.S.'s wood-framed architecture.

U.S. plywood producers sue over false labeling of off-grade Brazilian panels

Ten domestic plywood producers have jointly filed a lawsuit against U.S. certification agencies for falsely labeling imported ineffective panels. The group claims that structural panels produced in Brazil are being certified and stamped upon entry to the U.S. even though they don't meet the country's minimum requirements for stiffness and deflection.

3XN reveals North America's tallest timber office tower in Toronto

Danish studio 3XN has revealed renderings of its latest addition to the Toronto waterfront, a ten-story timber office tower. Once complete, the 138-foot-tall T3 Bayside will not only be the third 3XN tower to spring up in Bayside but also the tallest timber office building in North America.

Finland's Venice Biennale pavilion will highlight prefab timber housing industry

The little-known history of Finland's prefabricated timber housing will be on display in the Finnish Pavilion at this year's Venice Biennale. *Archinfo Finland* announced that *New Standards*, curated by Laura Berger, Philip Tidwell, and Kristo Vesikansa, will explore the housing model as part of the 2020 event's theme: *How will we live together?*

Mjøstårnet by Voll Arkitekter is now the world's tallest timber tower

Mjøstårnet by Voll Arkitekter is a 280-foot, 18-story tower in Brumunddal, Norway. It's the third-tallest building in the country and features office space, apartments, a hotel, a ground-floor restaurant, and an adjoining public bath.

Shigeru Ban Architects completes a sprawling mass timber campus for Swatch

Shigeru Ban has made a career out of pushing the limits of construction, and in 2020, the Japanese architect completed one of the largest hybrid mass timber structures in the world. The 500,000-square-foot Swatch and Omega Campus in Biel/Bienne, Switzerland, took over eight years to build and is composed of three new buildings by Shigeru Ban Architects.

America's largest mass timber building opens at the University of Arkansas

Adohi Hall is a 202,027-square-foot residential project constructed using cross-laminated timber. Leers Weinzapfel Associates led a design team for the $79 million series of interconnected structures. Mackey Mitchell Architects, modus studio, and OLIN helped bring the student complex to life. (See page 30 for more on this project.)

COURTESY DIDIER BOY DE LA TOUR

Hacker Architects reveals the U.S.'s next largest mass timber office building in San Francisco

San Francisco will soon have the largest mass timber office building in the United States as part of a 28-acre project on its historic Pier 70. Developed by Brookfield Properties, the six-story, 310,000-square-foot structure will be among the first of a series of new buildings, scheduled for completion in the next 10-to-15 years, to anchor the waterfront development.

A twisting timber tree house by modus studio blooms above the forest floor

Tree House floats above the Garvan Woodland Gardens, a 210-acre botanical garden owned by the University of Arkansas—frequent modus studio collaborators. Rather than sitting at the base of the oak and pine trees found in the Evans Children's Adventure Garden, Tree House has been elevated to the top of the forest, allowing for expansive views of the canopy.

For more information and images for all of these stories, visit archpaper.com/ICYMI

Henning Larsen proposes an all-timber neighborhood in Copenhagen

Copenhagen-based firm Henning Larsen has proposed a neighborhood south of central Copenhagen that would use all-timber construction. The neighborhood, named Fælledby, was the winning concept of a national design competition hosted by local real estate company By & Havn, and was designed in collaboration with local engineers MOE.

COURTESY HENNING LARSEN

80 Atlantic debuts as Toronto's first timber office building in a century

This fall, 80 Atlantic became the first wood-frame commercial building completed in Toronto in over a century. Part of a larger commercial development near the King Street corridor and a few blocks north of the Gardiner Expressway, the five-story, 90,000-square-foot structure was designed by Canadian firm Quadrangle for local developer Hullmark.

RISD uses timber for its first new residence hall in 34 years

The Rhode Island School of Design (RISD) has completed North Hall, the first dormitory the school has built in 34 years. Designed by Boston-based NADAAA, the six-story, 40,790-square-foot residence hall at 60 Waterman Street houses 148 first-year students of the Providence-based art and design school. (See page 38 for more on this project.)

Zaha Hadid Architects' plan for an all-timber stadium in England approved

Forest Green Rovers Eco Park Stadium by Zaha Hadid Architects was finally approved for construction in Gloucestershire, England, after years of delays. The new, carbon-neutral home of the Forest Green Rovers Football Club will be the first soccer stadium in the world built entirely out of wood.

Studio Libeskind reveals its Maggie's Centre in north London

Studio Libeskind revealed its timber-fronted vision for the new Maggie's Centre at the Royal Free Hospital in north London. Set to replace the existing Cancerkin Centre facility—with which Maggie's merged in 2016—the structure will be the 21st of its kind in the United Kingdom.

Herzog & de Meuron reveals revamped Vancouver Art Gallery

Herzog & de Meuron has finalized the design of a 300,000-square-foot, timber building for the Vancouver Art Gallery. The $350 million addition to the arts complex in Vancouver, Canada, also has a new name: The building will be called the Chan Centre for the Visual Arts, in honor of a $40 million private donation from the Chan family announced in 2019.

North America's future tallest timber tower wins city support in Milwaukee

Milwaukee's City Plan Commission recommended that a rezoning at 700 East Kilbourn Avenue move ahead, clearing the way for Ascent, a mass timber tower designed by Korb + Associates Architects. The tower's first five stories would rise on concrete, and the remaining 15 stories would be built from mass timber fastened with steel connectors.

Kengo Kuma dangles a timber cabin for a Swiss writers' residency

Tucked at the base of the Jura Mountains in Switzerland lies the Jan Michalski Foundation, which offers writers' residencies with sweeping views of the Alps. The campus includes several cabins, including the recently completed Suspended Forest by Kengo Kuma, a faceted, hanging house clad in timber both inside and out.

Sidewalk Labs reveals Snøhetta and Heatherwick designs for its Toronto development

Toronto's "smart neighborhood" is inching ever closer to reality. Sidewalk Labs released new renderings from Snøhetta and Heatherwick Studio, as well as documents detailing how the company plans to pay for the ground-up development. The waterfront Quayside neighborhood is being touted as an interconnected, "100-percent timber" development.

COURTESY HEATHERWICK STUDIOS

The Nature Conservancy turns to LEVER for its Oregon headquarters

The Nature Conservancy's Oregon chapter headquarters, the Oregon Conservation Center in Portland, has reopened after an expansion and renovation led by LEVER Architecture. The updated building reflects the mission of the organization, which aims to enrich human lives through conservation. (See page 13 for more on this project.)

8 Open

Midwest

St. Kilda Surf & Turf


CAMERON CAMPBELL


CAMERON CAMPBELL

Neumann Monson Architects complements relaxed food service with exposed structural timber at St. Kilda Surf & Turf, a restaurant serving Australian-inspired fare in Des Moines's East Village neighborhood. The restaurant occupies one corner of the ground level of the first mass timber building in the U.S. to feature a dowel laminated timber (DLT) structure, which uses a friction-fit system with no glue, nails, or fasteners. The neutral and natural palette of spruce columns and beams and white oak furniture is punctuated by a steel-clad wall and the dark tile of the bar at the restaurant's center. Customers can enjoy a brunch of avocado toast and flat whites that is as on-trend as the building structure they sit in. **Emma Natanzon**

11 East Grand Avenue Suite 101 Des Moines, Iowa	515-288-1086
Architect:	Neumann Monson Architects

West

The Tree Farm


SEAN GILLIGAN

The Tree Farm in Portland, Oregon, offers an unconventional response to the status quo of office building design: The six-story structure has living fruit trees in individual steel planters braced to all four facades. "Portland's identity is intertwined with trees and timber. The Tree Farm adds to this heritage by celebrating the importance of trees as a building material and as an icon of the city's history," said lead architect Ben Carr of Brett Schulz Architect.

The building employs a combination of construction types, with a cast-in-place concrete ground floor leading to wood construction in floors two through six. Exposed wood beams and columns provide a structural frame enclosed by wood-stud exterior walls. Each of the 56 planters connects to a steel post within the exterior wall, transferring much of its weight back to the frame. A drip irrigation system waters the trees, which in turn provide shade for the large picture windows. **Shawn Simmons**

850 SE 3rd Avenue Portland, Oregon	
Architect:	Brett Schulz Architect

East

Providence River Pedestrian Bridge


COURTESY KROO PHOTOGRAPHY

Downtown Providence, Rhode Island, has received a pedestrian-friendly upgrade from Detroit-based inFORM Studio and structural engineer BuroHappold. Last year, the Providence River Pedestrian Bridge opened with the intention of connecting the bisected city. Part of the newly developed Innovation & Design District, the bridge also links the campuses of Brown University, Johnson & Wales University, and the Rhode Island School of Design.

The 394-foot walkway cuts across the river and is set atop existing granite piers, which originally supported the narrow stretch of Interstate 195 that traversed the river before the highway was relocated in 2013. Wood cladding by SITU Fabrication provides a warmth that respects the historic character of the New England city, while a distinct, bowed shape blends functionality with a picturesque sensibility. The bridge features a terrace at its eastern end with built-in seating, greenery, and decorative lighting. **SS**

Providence, Rhode Island	
Architect:	inFORM Studio

9 Eavesdrop

BIG Trouble in Brazil

FRANK VAN LEERSUM, JESO CARNEIRO, AND THE STOREFRONT FOR ART AND ARCHITECTURE/FLICKR

Bjarke Ingels was spotted hobnobbing in Brazil with the country's far-right president, Jair Bolsonaro, drawing internet ire (the pair is shown in a collage above). On January 14, Ingels was photographed with Bolsonaro at the Palácio do Planalto, in Brasília, as part of a trip arranged by tourism minister Marcelo Álvaro Antônio. According to the Ministry of Tourism, investors from the Nomade group, a hospitality investment group, are looking into investing in sustainable tourism projects in Brazil, and after inviting Ingels to join them, the delegation visited the states of Ceará, Piauí, and Maranhão before meeting with the president.

Given Bolsonaro's history of inflammatory comments and fondness for rolling back environmental protections (consistent with his denial of climate change), commentators were quick to pounce on Ingels's seeming willingness to work with him—especially since Bjarke Ingels Group often touts its projects as culturally and environmentally responsible. The official statement Ingels provided to *AN* didn't do much to clarify this, either:

"The last months have shown with jarring clarity that the social challenges of Northeast Brazil are beginning to translate into ecological challenges. We have traveled Brazil's Northeast region with our collaborators from Nomade Group and met with local governors and mayors, as well as the relevant ministries of Economy, Culture and Tourism, and finally the president's office to gauge the possibility of devising a holistic master plan for the Northeastern coastal states of Brazil to create ecologically and economically sustainable development. We return incredibly encouraged with the awareness and readiness we have encountered at all levels of government across the entire political spectrum as well as across state borders and city limits to collaborate toward creating a regional master plan for socially and environmentally sustainable communities."

Coincidentally (or maybe not), a sponsored interview with Ingels appeared a few days later on *ArchDaily*, where Ingels extolled the virtues of pragmatism and advocated for designing our way out of the climate crisis.

Of course, the pile-on continued, as commentators pointed out the piece's suspicious timing and tone-deaf title: "If we can Change the Climate of the World by Accident, Imagine What we can Achieve by Trying."

A week later, Ingels sent a letter to *AN* detailing his reasoning, stating: "Creating a list of countries or companies that BIG should shy away from working with seems to be an oversimplification of a complex world. Dividing everything into two categories is neither accurate nor reasonable. The way the world evolves isn't binary but rather gradual and on a vast array of aspects and nuances. If we want to positively impact the world, we need active engagement, not superficial clickbait or ignorance."

The Masterplanet Master-Maker

Bjarke Ingels is taking over the world—or at least wants to redesign it. At the first lecture of the semester at Columbia University's Graduate School of Architecture, Planning and Preservation, the architect debuted his intentions to create a master plan for Earth. Aptly named the Masterplanet, the concept would surely—if followed through—make Ingels the most influential architect on God's green earth, right?

Maybe not. It doesn't sound like many people were buying the BIG idea, which Ingels claims would help curb the effects of "cyclical" climate change and included plans for humans moving to Mars. (He compared humans flying to the red planet to Ferdinand Magellan's voyage around the Earth.) The global public could listen in via livestream, so Twitter soon exploded with comments about the talk. Ingels was called a climate denier, a climate opportunist, a capitalism-booster, and naive, among other things.

Ingels was recently quoted in a Norwegian publication saying (via translation) that his Masterplanet would be conceived through "a few large private companies, international institutions, [and] investment opportunities," adding that "architects, engineers, and investors," and not "politicians and scientists," should decide our future.

OMA, OH MY

On Twitter, urbanist Jonny Anstead posted unflattering photos of OMA's recently completed School of Science and Sports at Brighton College (below) in Brighton, England, in response to rave reviews from the design media—which, he noted, largely ignore the building's unfortunate street presence.

"It goes on, and on—a continuous frontage of 121 metres. It's the new Sports & Science Centre of Brighton College, designed by OMA," wrote Anstead. "The other side of the new building—which faces away from the street and fronts the school's playing fields, looks very different. Whether you like it or not, you can see that's where the effort has been made."

Guardian critic Oliver Wainwright chimed in: "I was blocked from reviewing OMA's latest project. Not the first time they've excluded critical critics." Of course, as other users pointed out, there's nothing stopping Wainwright from reviewing the building once it's open to the public.

LAURIAN GHINITOIU

LAURIAN GHINITOIU

Close the Blinds

It's every design fan's worst fear: A survey of more than 2,000 U.K. homeowners by MyJobQuote, a British home renovation start-up, says 72 percent of respondents have stolen furniture ideas from a neighbor, while 66 percent admit to copying decor, and 57 percent have lifted a neighbor's color scheme.

This tracks pretty closely to the results of a 2018 poll by *The Independent*. Of the 2,000 adults in the U.K. the paper surveyed, about half admitted to similar behavior—and a full fifth confessed to making up an excuse to scout out friends' and neighbors' homes for flourishes to copy. Kitchen appliances, plants, curtains, and even furniture layouts were all ripe for replication—making the homes of unsuspecting hosts into real-life Pinterest boards. But in the age of Instagram, *Apartment Therapy*, and countless other outlets for gathering "inspiration" on how to decorate your living space, is this necessarily wrong?

Send BIG tips to eavesdrop@archpaper.com.

COURTESY OREGON FOREST RESOURCES INSTITUTE

Recent changes to local U.S. building codes will let timber towers rise to new heights.

Tall Tales **continued from front page** timber manufacturing facilities, increasing demand for use of California wood products." The proposal for a code amendment submitted to the Denver Community Planning and Development Committee led with environmental concerns, explaining that including the new building types would "support Denver's stated commitment to the environment through its 2020 Sustainability Goals" and "promote a symbiotic relationship between the city of Denver and regional forests, resulting in healthier forests."

The new timber construction classes—IV-A, IV-B, and IV-C—specify not only the maximum height and square footage of each potential new structure, but also the "required fire-resistance rating of the structure and the protection specified, in terms of timber surface encapsulation," according to Oregon's Building Codes Division. Type IV-A boasts the tallest building height, 270 feet or 18 stories, with a total allowable building area of 972,000 square feet; Type IV-B has a maximum building height of 12 stories or 180 feet, with a total allowable building area of 648,000 square feet; and Type IV-C caps building height at 85 feet or 9 stories, with a maximum area of 405,000 square feet.

The recent adoptions could inspire greater use of new methods of wood construction in larger and taller buildings. The ICC's code allows cross-laminated timber, structural composite lumber, glued-laminated timber, and large-section sawn lumber. **Julia Ingalls**

New Ka-terrain

What is the future of Katerra?

Since its founding in 2015, Katerra—a design-build company that "exists to help transform construction through technology," according to its website—has expanded to 8,000 employees globally, pursued projects in the United States and Asia, and earned a $4 billion valuation from SoftBank, the Japanese conglomerate backing WeWork, Compass, and other massive startups. Katerra offers an amalgam of advanced prefabricated components (hotel room pods, facades and glazing, and precast concrete walls, among other products) and a cloud-based organizational approach to construction and design. Similar to the way Amazon condensed the brick-and-mortar shopping experience into one click, Katerra aims to streamline the complex businesses of large-scale design, materials sourcing, manufacturing, and construction into a single process. Katerra recently completed a 97-unit apartment building in Hayward and a 120-unit building in Santa Rosa.

Katerra's motivations are both pragmatic and humanitarian. "We have an opportunity within the next decade to develop new solutions the right way, solutions that not only ramp industry productivity, but also drastically reduce the carbon footprint of construction and provide relief for housing shortage and affordability," its website argues. This well-intentioned, technologically powered cost-effectiveness gained real muscle in 2018 when the U.S.-based Katerra merged with KEF Infra, an India-based off-site construction company specializing in precast components. The company's website says that the merger will "expand [Katerra's] geographic reach, manufacturing capacity, and market expertise," and that "both companies used a vertically integrated model, offering end-to-end building services enhanced by off-site manufacturing and enterprise technology."

The merger, which has helped Katerra develop more than 50 patents and additional "industry-leading applications of technology," has also enabled the launch of an end-to-end building services software company, known as Apollo, that will make its debut in 2020. The software launch follows the successful opening of the company's $150 million cross-laminated timber (CLT) factory in Spokane Valley, Washington. CLT can be used in place of concrete or steel in buildings with a maximum height of 18 stories, according to the International Code Council, making it a potentially competitive alternative material for many low- and medium-rise construction projects.

As of now, Katerra plans to concentrate on "growing our business in India, the Middle East, and the U.S.," a spokesperson said. "These are the regions we will focus on for some time before we consider expansion to other geographies." **JI**

See more images at archpaper.com.

Anything But Micro

WRNS Studio designs largest timber project in North America.

While many cross-laminated timber (CLT) buildings have tested the vertical limits of the product, San Francisco–based architecture firm WRNS Studio recently set a record by designing North America's largest CLT building in floor area. At over 644,000 square feet, the firm's addition to Microsoft Silicon Valley, part of a larger renovation of the campus, demonstrates CLT's potential as a building material for expansive horizontal structures.

Given how few CLT projects currently exist in Northern California, the mixed-use building's construction required thorough coordination between the project team and the local building authority to determine the optimal methods for engineering with the product. Extensive research was required to ensure that the swaths of exposed CLT would achieve fire ratings suitable for a building of its size in fire-prone California. Local engineering firm Holmes Structures developed lightweight CLT floor plates that conceal the building's immense power and data infrastructure beneath a thin top layer of cement. These CLT-concrete composite slabs require few load-bearing beams and columns, allowing copious amounts of sunlight to illuminate the building's expansive interiors.

In an effort to reduce construction waste, WRNS renovated two existing buildings on-site while reusing the materials of the remaining buildings as the foundation of the two-story CLT structure. Over 345,000 square feet, or 2,400 tons, of CLT panels are used throughout the campus, representing more than half of the project's total structural components.

The new, low-lying structure was designed to complement its natural surroundings through the addition of an occupiable living roof, a series of interior courtyards, and on-site trails that lead to nearby Stevens Creek. Every workspace within the building will have direct access to an outdoor space while allowing its occupants to precisely control airflow, temperature, and lighting within their individual working environments with minimal energy use.

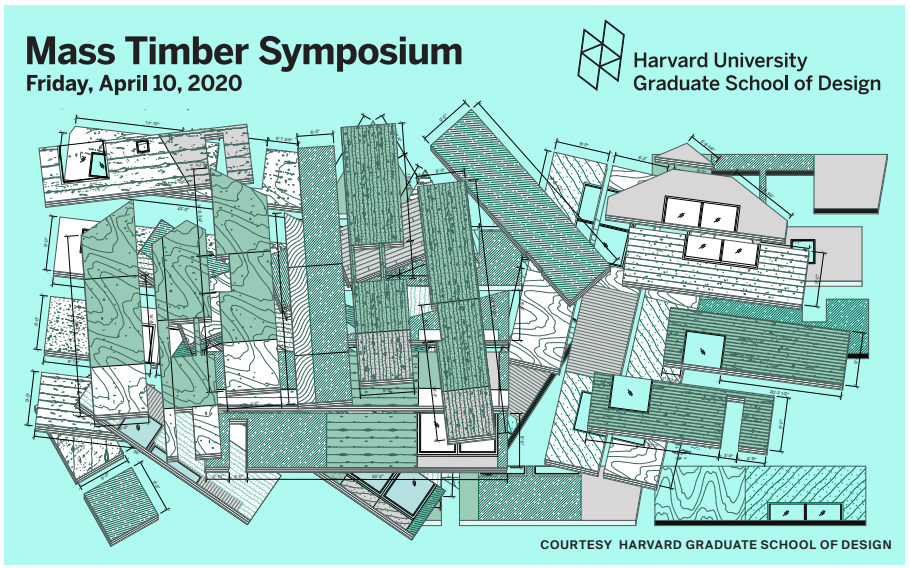
Construction began in December 2017 and is expected to be completed by fall 2020. **Shane Reiner-Roth**

See more images at archpaper.com.

COURTESY OF WRNS STUDIO

Rendering of WRNS Studio's Microsoft Silicon Valley addition.

Beyond Instrumentality and Technology



On April 10, 2020, the Harvard Graduate School of Design will host "Mass Timber: Beyond Instrumentality and Technology," a symposium organized by Jennifer Bonner and Hanif Kara. The symposium, along with a corresponding option studio, will attempt to move discourse around mass timber beyond sustainability and industry advancements, or "instrumentality and technology," by provoking design positions from a roster of architects, engineers, developers, and manufacturers.

Citing a "Scandinavian Effect," through which innovations coming out of Sweden and Norway are inaugurating a shift in the history of building (like the Bilbao or Chicago Effects), the symposium will attempt to define a design agenda for the global mass timber movement. **MS**

Participants:
Nader Tehrani, NADAAA
Friedrich Ludewig, ACME
Aaron Forrest and Yasmin Vobis, Ultramoderne
Kirsten Haggart, Waugh Thistleton Architects
Moderator: Jennifer Bonner, MALL
Michael Ramage, Cambridge University
Ben Kaiser, Kaiser Group and Path Architecture
Kay Hartmann, KLH UK
Susan Jones, atelierjones
Moderator: Hanif Kara, AKT II

Sponsors: Sven Tyréns Trust Sweden and the Harvard Graduate School of Design

Aerial rendering of the Microsoft Silicon Valley campus addition looking southeast.

LEVER Architecture

"People connect to wood differently than other materials," said Thomas Robinson, founder and principal of Portland, Oregon–based LEVER Architecture. While training in the offices of Allied Works and Herzog & de Meuron, Robinson was initially attracted to the material because of this deep phenomenological resonance. But as his own firm dove further into the use of regionally sourced wood, he started to appreciate structural timber for its ease of acquisition, carbon-capturing capabilities, and flexibility in construction, too.

"Wood is important," explained Robinson, "but innovation is what drives our interest in wood." LEVER has consistently been at the forefront of timber construction for the last several years and has demonstrated its ability to design at varying scales and through a wide range of innovative building techniques. Here, *AN* rounds up a few of the studio's diverse wood-centric projects.

Shane Reiner-Roth

JEREMY BITTERMANN

L'Angolo Estate

Standing as a beacon within a sprawling, 23-acre winery outside of Newberg, Oregon, L'Angolo Estate was designed in response to the surrounding views and the area's unique climatic conditions. Douglas fir, cedar siding, and dark anodized aluminum contribute to a rustic material palette that visually connects to the native Oregon oak trees that populate the valley.

Two cantilevered Douglas fir roof structures interlock over the entry, giving the building a grandeur that belies its petite 2,200-square-foot footprint. The ceiling of the tasting room is striped with 86 glulam beams that lead the eye to the rolling hills in the distance. The tasting room can expand toward that view through the two large sliding doors, which along with clerestory windows create an effective passive cooling system in the summer.

JEREMY BITTERMANN

Mass Plywood Pavilion

In 2017, Lyons, Oregon–based company Freres Lumber developed the Mass Plywood Panel, a veneer-based product that achieves the structural attributes of a CLT panel using 20 percent less wood, and commissioned LEVER to design the first structure in the country to use it. The Mass Plywood Pavilion, which debuted in Portland that same year, was built exclusively with timber sourced from forests within 100 miles of Freres's manufacturing plant.

The pavilion demonstrated the material's structural, aesthetic, and waste-reducing capabilities by using the fewest cuts possible to produce 15 panels. Four of the panels were cut in half to become the pavilion's structural frame, while others became a floor and cantilevered roof. Made with minimally treated materials, the project also showed off the product's ability to withstand the weather conditions in the Pacific Northwest.

Oregon Conservation Center

Completed in 2019, the Oregon Conservation Center dramatically renovates the Oregon chapter of The Nature Conservancy's original, 1970s office building, which had poorly lit interiors, inefficient office layouts, and an uninspiring facade. As one of the first buildings in the U.S. to be built with cross-laminated timber (CLT) panels certified by the Forest Stewardship Council, the project reflects the client's own progressive sustainability goals.

The firm revamped the dated structure by introducing materials and plantings that evoke three regional habitats: the Rowena Plateau, the Cascade-Siskiyou National Monument, and western hemlock and cedar forests. The majority of the materials were sustainably harvested from the client's conservation sites, while the original building's exterior was completely redesigned with steel cladding that will gracefully develop a patina over time. The structure incorporates a number of energy-efficient initiatives, including rooftop photovoltaics that produce a quarter of the building's energy supply and a subsurface filtration system that manages and redistributes all stormwater on-site.

Redfox Commons

Located in a quickly developing neighborhood in Northwest Portland, Oregon, Redfox Commons combines two former industrial structures from the 1940s to create a light-filled office campus with more than 60,000 square feet of usable space. LEVER stripped the original buildings down to their timber framing and exposed the wood within the interior while adding 80-foot-long clerestory windows that bring generous natural light into the massive open spaces. Ribbon windows on the steel-clad exterior draw in even more light.

LEVER also designed and built a glassy entrance structure to connect the two older buildings. The firm used over 6,500 linear feet of salvaged wood from a preexisting mezzanine building on the site to make a timber tunnel walkway on the second floor.

Kosciuszko à Gogo

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

2020 U.S. WoodWorks Wood Design Awards

Jury

Danny Adams, Principal, LS3P Associates
Marsha Maytum, Principal, Leddy Maytum Stacy Architects
Eric McDonnell, Principal, Holmes Structures
Matt Shaw, Executive Editor, *The Architect's Newspaper*

Category Winners

1 Multi-Family Wood Design

Adohi Hall
Location: Fayetteville, Arkansas
Architects: Leers Weinzapfel Associates, modus studio (architect of record), Mackey Mitchell Architects
Structural engineer: Equilibrium Consulting, Engineering Consultants
Contractor: Nabholz Construction

2 Commercial Mid-Rise

111 East Grand
Location: Des Moines, Iowa
Architect: Neumann Monson Architects
Structural engineer: Raker Rhodes Engineering
Contractor: Ryan Companies

3 Commercial Low-Rise

Redfox Commons
Location: Portland, Oregon
Architect: LEVER Architecture
Structural engineer: KPFF Consulting Engineers
Contractor: R&H Construction

4 Wood in Government Buildings

Billie Jean King Main Library
Location: Long Beach, California
Architect: Skidmore, Owings & Merrill (SOM)
Structural engineer: SOM
Contractor: Clark Construction
Installer: W.S. Klem

5 Wood in Schools

Arts & Technology Academy
Location: Eugene, Oregon
Architect: Opsis Architecture, Rowell Brokaw Architects (architect of record)
Structural engineer: catena consulting engineers
Contractor: Hyland Construction

6 Institutional

Oregon Conservation Center
Location: Portland, Oregon
Architect: LEVER Architecture
Structural engineer: KPFF Consulting Engineers
Contractor: Lease Crutcher Lewis

7 Green Building with Wood

Oregon Zoo Education Center
Location: Portland, Oregon
Architects: Opsis Architecture, Jones & Jones
Structural engineer: catena consulting engineers
Contractor: Fortis Construction

8 Beauty of Wood

The Trailhead at Theodore Wirth Park
Location: Minneapolis, Minnesota
Architect: HGA
Structural engineer: HGA
Contractor: KALCON

9 Adaptable and Durable Wood Structures

Julia Morgan Hall
Location: Berkeley, California
Architect: Siegel & Strain Architects
Structural engineer: Bluestone Engineering
Contractor: James R. Griffin
Wood structure: Light-frame roof, floors, and walls

10 Jury's Choice Award

First Tech Federal Credit Union
Location: Hillsboro, Oregon
Architect: Hacker
Structural engineer: Kramer Gehlen & Associates
Contractor: Swinerton

Regional Excellence Awards

901 East Sixth
Location: Austin, Texas
Architects: Thoughtbarn and Delineate Studio

Co|Lab
Location: Falls Church, Virginia
Architect: William McDonough + Partners

The Continuum
Location: Lake City, South Carolina
Architect: McMillan Pazdan Smith Architecture

Museum of Fine Arts, Houston, Sarah Campbell Blaffer Foundation Center for Conservation
Location: Houston, Texas
Architect: Lake|Flato Architects

DPR Construction Sacramento Office
Location: Sacramento, California
Architect: SmithGroup

Pike Place MarketFront
Location: Seattle, Washington
Architect: The Miller Hull Partnership

Rhode Island School of Design North Hall
Location: Providence, Rhode Island
Architect: NADAAA

Sideyard
Location: Portland, Oregon
Architect: Skylab Architecture

Tre Søstre
Location: Grand Marais, Minnesota
Architect: Salmela Architect

15 News


4
COURTESY W.S. KLEM


8
PETER VONDELINDE


3
JEREMY BITTERMAN


6
JEREMY BITTERMAN

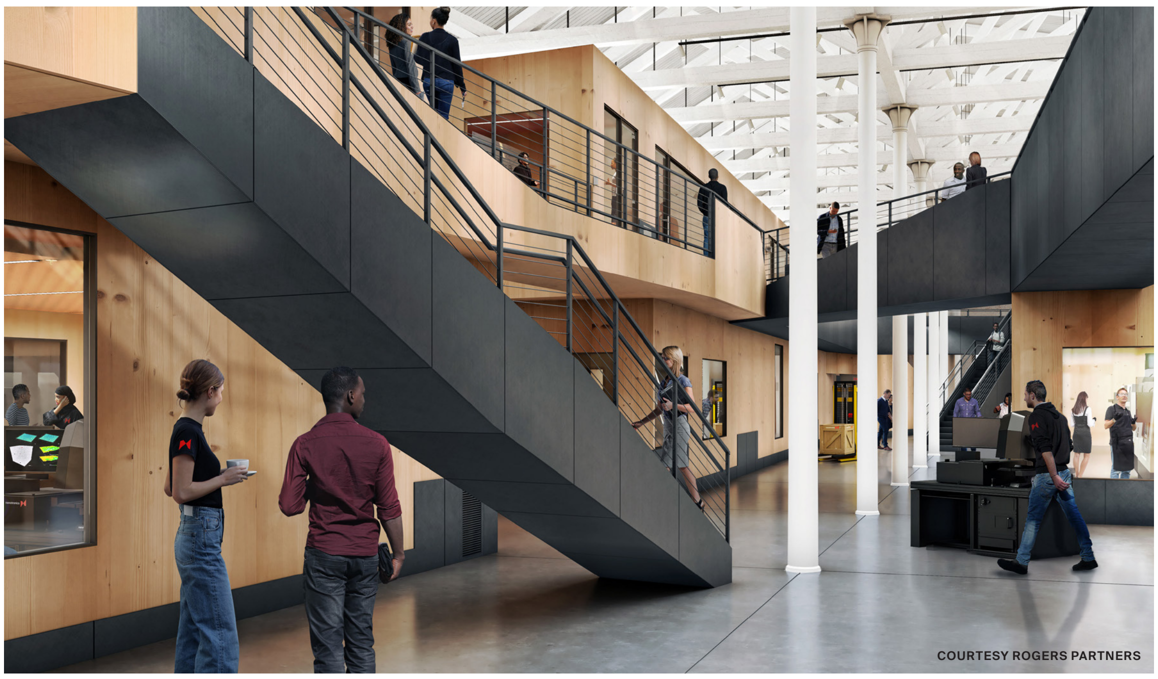

9
DAVID WAKELY


10
JEREMY BITTERMANN


2
MIKE SINCLAIR

Tiny Tech Timber

Rogers Partners uses CLT for a new nanotech factory.

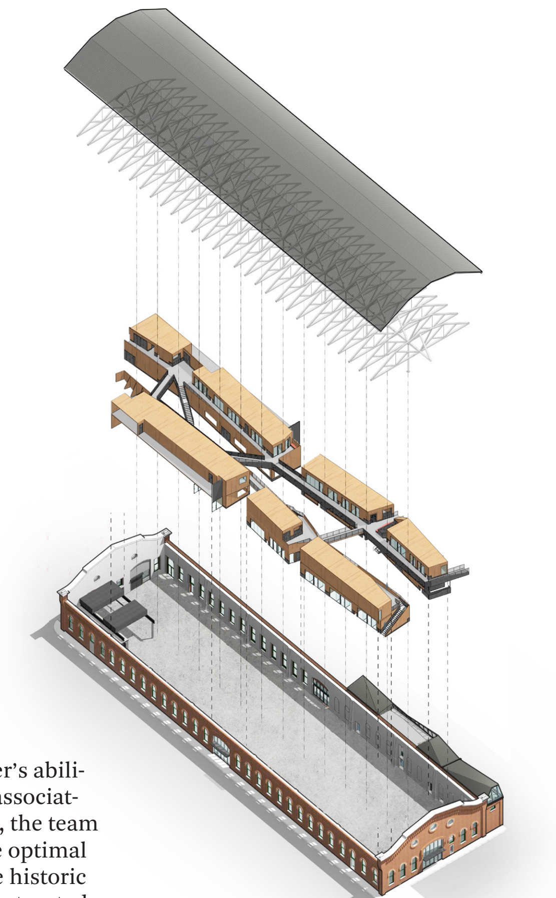


COURTESY ROGERS PARTNERS

Rendering of the interior of Rogers Partners' Nanotronics Smart Factory.

Nanotronics, a company on the forefront of nanotechnological precision manufacturing, has enlisted New York–based architecture firm Rogers Partners to design a factory as advanced as the work it will produce there. In October 2018, the two began a collaboration on the Nanotronics Smart Factory, a vertically integrated, flagship production center for the company set within a 34,000-square-foot 19th-century former shipbuilding facility in New York's Brooklyn Navy Yard. Nanotronics hopes that the project will push the city's manufacturing economy forward while demonstrating how manufacturing can have a renewed presence within dense American cities in general.

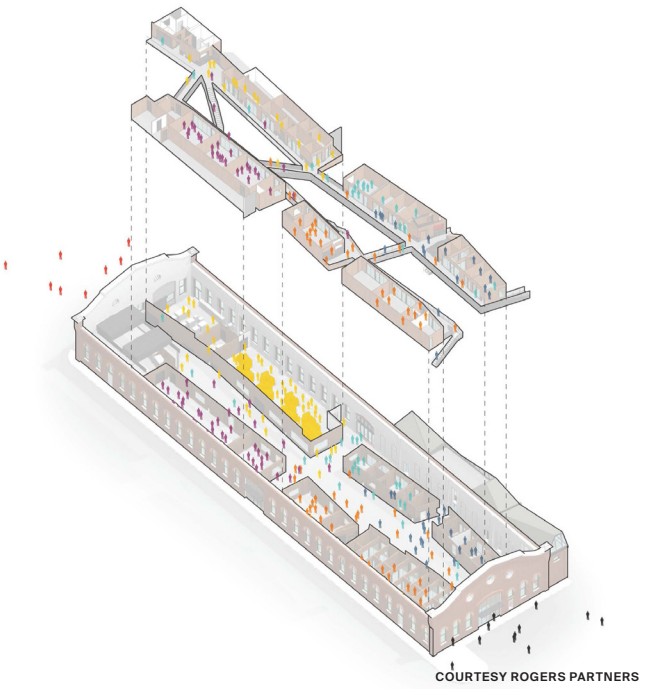
A major goal of the project is to develop a facility that is cleaner and more efficient than a typical factory. Given timber's ability to offset the carbon emissions associated with the project's construction, the team felt that the material would be the optimal choice in the adaptive reuse of the historic building, which was originally constructed using a mix of then-novel composite steel and timber. Rogers is preserving the original brick envelope while organizing the in-



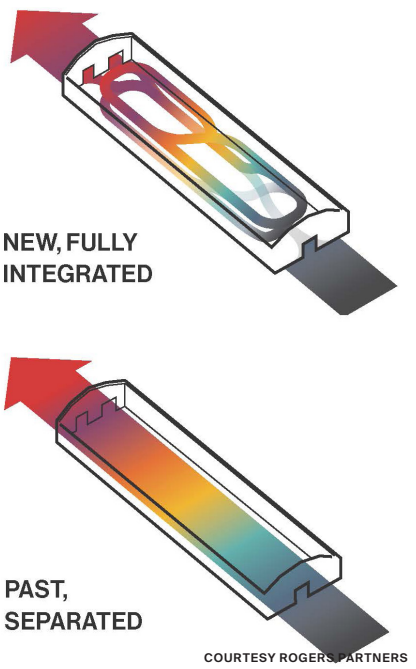
COURTESY ROGERS PARTNERS

Pods made of CLT will be built within the existing shell to accommodate offices.

The building is in the Brooklyn Navy Yard along New York's East River.



The two-floor interior features catwalks to connect the upper level.



The layout allows groups to flexibly interact.

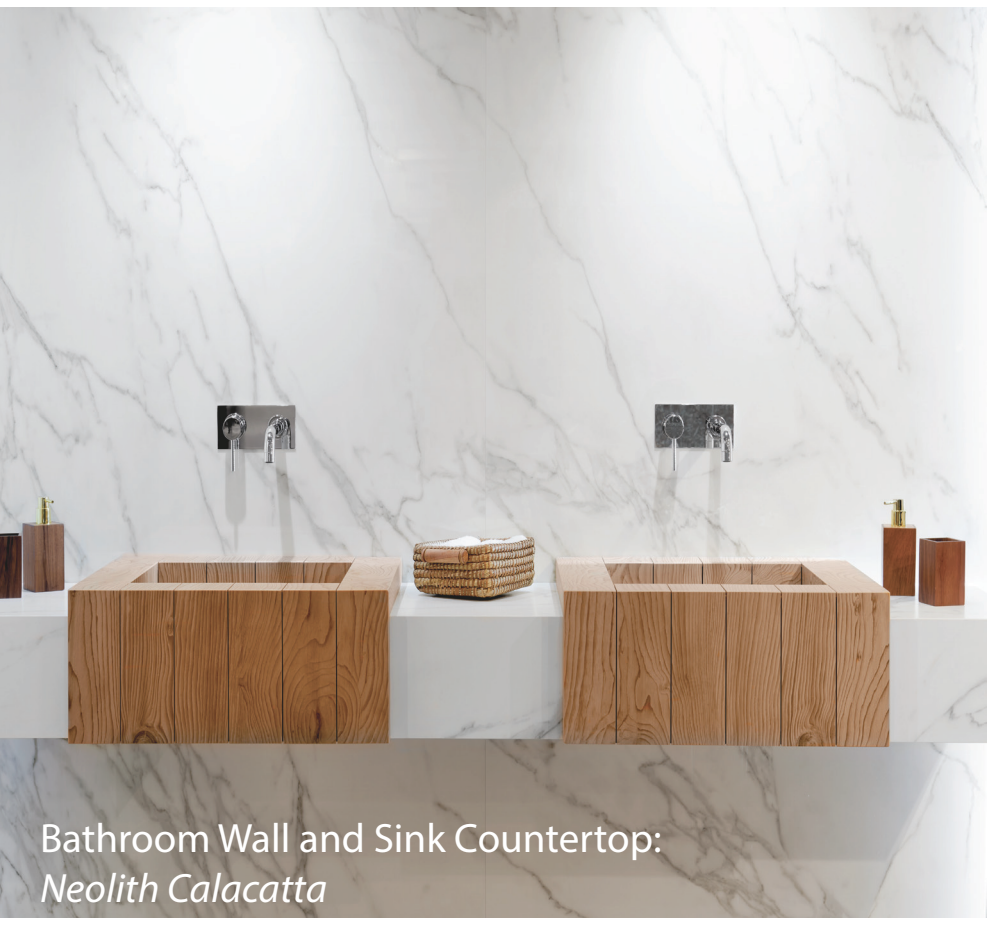
terior into "pods" fabricated entirely out of CNC-routed cross-laminated timber (CLT).

While CLT has gained popularity as a building material in parts of the world with nearby timber reserves—including the Pacific Northwest, Canada, and several areas of Europe—New York City's building code does not yet allow timber structure buildings taller than six stories. The factory is one of the first local projects to employ the product. The pods will be built off-site in a nearby factory and, within a period of two to three weeks, will be shipped to the Navy Yard site and erected within the preserved structure. They will be airtight, soundproof, and climate-controlled to meet highly sensitive manufacturing standards.

The factory is arranged to allow the company's design, research and development, and manufacturing departments to communicate as efficiently and transparently as possible. The first floor is reserved for milling and assembly processes and offices for tech support, sales, and marketing, while the second floor contains workspaces for Nanotronics's executive, engineering, and design groups, all of which are connected via bridges in a figure-eight layout. The pods line the boundary walls to promote easy navigation along the building's central axis while making room for generously sized collaboration spaces.

It is anticipated that the project will finish this March. **Shane Reiner-Roth**

Kitchen Countertop and Backsplash:
Neolith La Boehme



Bathroom Wall and Sink Countertop:
Neolith Calacatta

Kitchen Island and Backsplash:
Neolith Nero Marquina

Neolith is a large format, sintered stone product that can be used for countertops, flooring, interiors and exterior walls

Characteristics of Neolith include scratch, stain, chemical, heat, and water resistance

HG STONES

HG Stones is an exclusive distributor of Neolith products

FLATIRON RESOURCE CENTER
28 W 25th Street, New York, N Y 10010 | 212.964.0900
www.hgstones.com | inf o@hgstones.com
Call to make and appointment & visit us

New Geometrees

Four designers are shaping timber's high-tech future.

Every so often, new materials revolutionize architecture. Concrete filled the monumental buildings of the Roman Empire, steel densified cities with structures that reached previously unthinkable heights, 20th-century plastic reconstituted the interior and the building economy along with it—and now timber is poised to push architectural design and practice into new territory. But why, in the 21st century, has timber become such a miracle material? And what will be the shape of its impact?

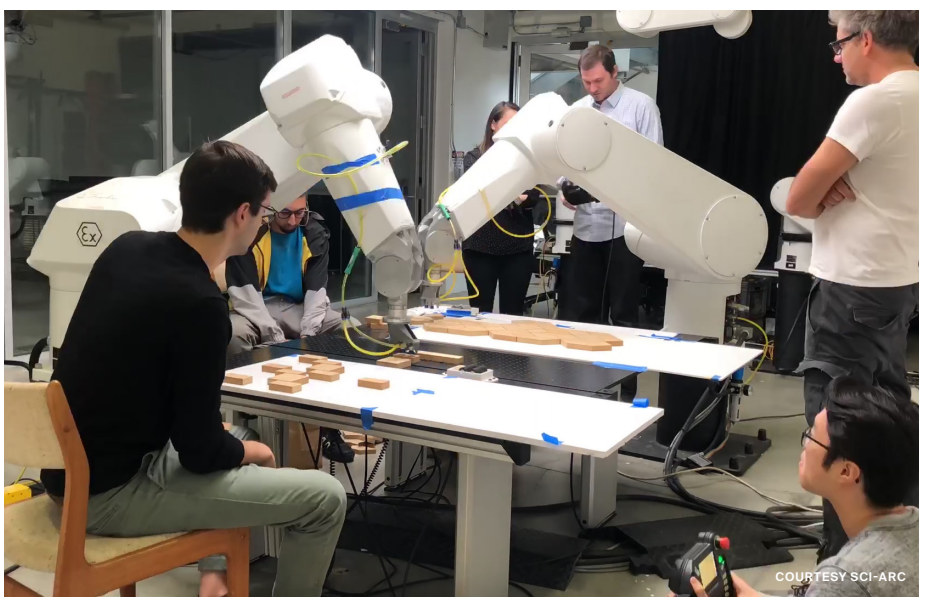
Though timber might seem like a strange solution to today's exponential global demand for building development, the material's stability, renewability, and capacity for sequestering carbon—rather than releasing it—are inspiring the building industry to invest heavily in its future.

Cross-laminated timber (CLT), the first engineered wood product with structural properties that rival those of steel and concrete, was first developed in Europe in the early 1990s, though it was not commonly used until the 2000s and was not introduced into the International Building Code until 2015. While firms around the world have been competing to build the largest and tallest timber structures to demonstrate the material's comparability to concrete and steel, a number of independent practitioners have been applying the latest fabrication methods, computational design techniques, and visualization software to explore the material's unique potential. Here, *AN* presents a cross section of institutions pursuing the belief that timber can be for the future what concrete, steel, and plastic have been for the past. By Shane Reiner-Roth

FRONT COVER IMAGE COURTESY BARTLETT B-PRO M.ARCH RESEARCH CLUSTER 4 : TWISTBOT (SHUTING GUO, JUNMING HUO, JIANGWEN FU, JIAQI WU) TUTORS: GILLES RETSIN, MANUEL JIMENEZ, VICENTE SOLER

M. Casey Rehm

Rehm's pavilion for the Tallinn Architecture Biennale was designed using neural network software.



SCI-Arc students used robots to produce inexpensive CLT panels.

SCI-Arc, Los Angeles

For SCI-Arc professor M. Casey Rehm, working with timber poses challenges for many aspects of architecture at once. Timber is rarely considered as a building material in Los Angeles, given the long distances required to obtain it and the high costs associated with its transportation and manufacturing. But if the industry of CLT manufacturing were reimagined, Rehm argues, the product could become far more cost efficient.

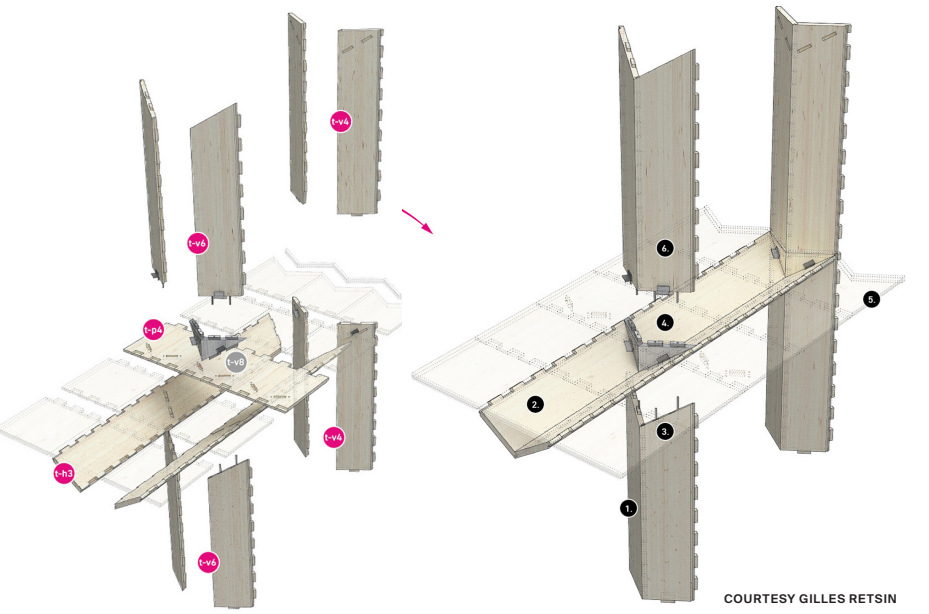
Mass timber products like CLT have been used in increasingly large structures around the world, such as multistory housing developments and office buildings, and Rehm believes the material can be adapted to a smaller scale for quick deployment. Rehm has been researching strategies with his students for producing inexpensive CLT panels for affordable housing and accessory dwelling units (ADUs) in L.A., which is experiencing a significant housing shortage.

"The focus of the research," Rehm said, "will pivot from the improvement of peak structural efficiency to creating lighter weight panels out of lower quality timber more suitable to residential scale construction."

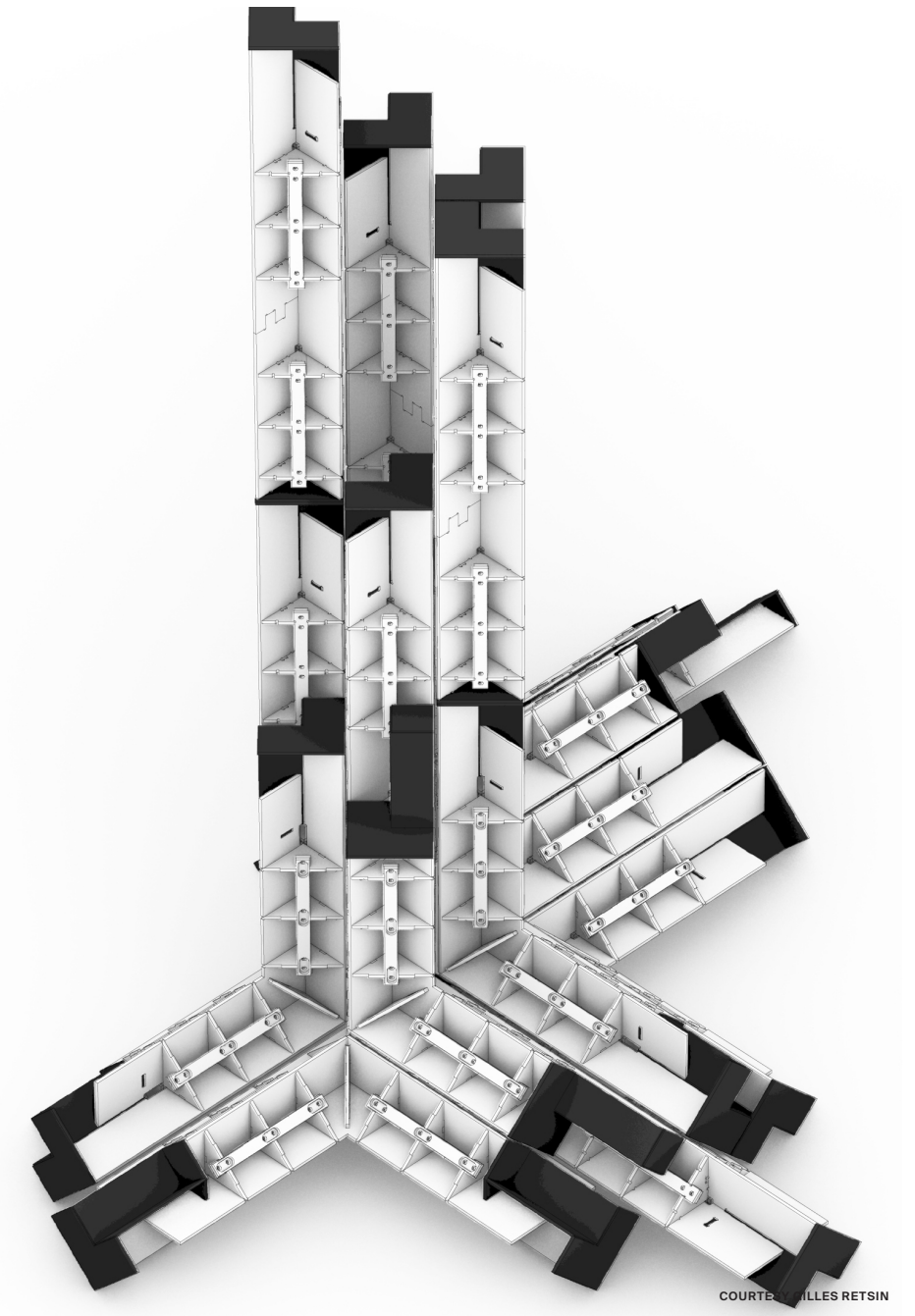
Rehm is exploring much more than just logistics—he is using timber in even his most formally and technologically speculative work. His proposal for the 2019 Tallinn Architecture Biennale was a pavilion that demonstrated how neural-network design software could be used to rapidly and robotically assemble CLT panels. "The robots would partially mitigate the extra labor involved with the production of more complex and panel specific layup patterns," Rehm said. "By uniquely designing each panel, structural performance is improved, requiring 10 to 15 percent less material and allowing for the use of panels in eccentric loading conditions."

Gilles Retsin

The Nuremberg Concert Hall proposal took advantage of an abundant local timber supply.



Connection details of Nuremberg Concert Hall demonstrate how the timber panels interlock.



Modular timber building blocks allow for the creation of myriad structural forms.

Retsin's team used augmented reality to assemble a pavilion at London's Royal Academy.

Bartlett School of Architecture, London

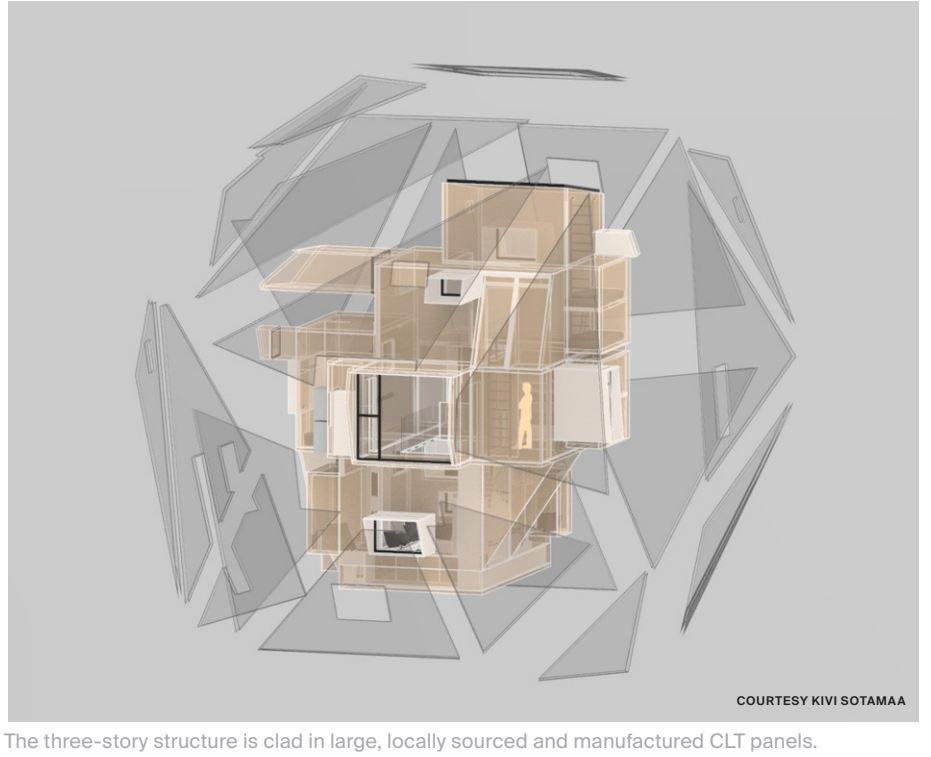
While London-based architect and professor at the Bartlett School of Architecture Gilles Retsin has long experimented with both computational design and novel fabrication methods, a recent focus on timber has propelled his practice in a new direction. *Real Virtuality*, a bulky wooden structure installed at London's Royal Academy in early 2019, for instance, was the architect's first attempt at applying augmented reality (AR) to modular timber construction. Using Microsoft's HoloLens AR headsets, the designers sent assembly instructions from the digital model directly to the construction team.

In a recent international competition for the Nuremberg Concert Hall, Retsin set his sights on a much larger scale, proposing what would have been the world's first robotically prefabricated timber concert hall. Designed in collaboration with architect Stephan Markus Albrecht, engineers Bollinger + Grohmann, climate engineers Transsolar, and acoustic specialists Theatre Projects, the proposal took inspiration from the site's location in Bavaria, a region with an abundance of timber. The building's form exhibits wood's lightness in the 30-foot sawtooth CLT prefabricated modules that define the main lobby spaces, which are exposed to the exterior through a glass envelope.

"Designing in timber not only means a more sustainable future," Retsin wrote in a press release, "but also has architects profoundly redesigning buildings from the ground up....We're really questioning the fundamental parts, the building blocks of architecture again."

Kivi Sotamaa

The Meteorite is monolithic on the outside but contains a network of intimate spaces within.



The three-story structure is clad in large, locally sourced and manufactured CLT panels.

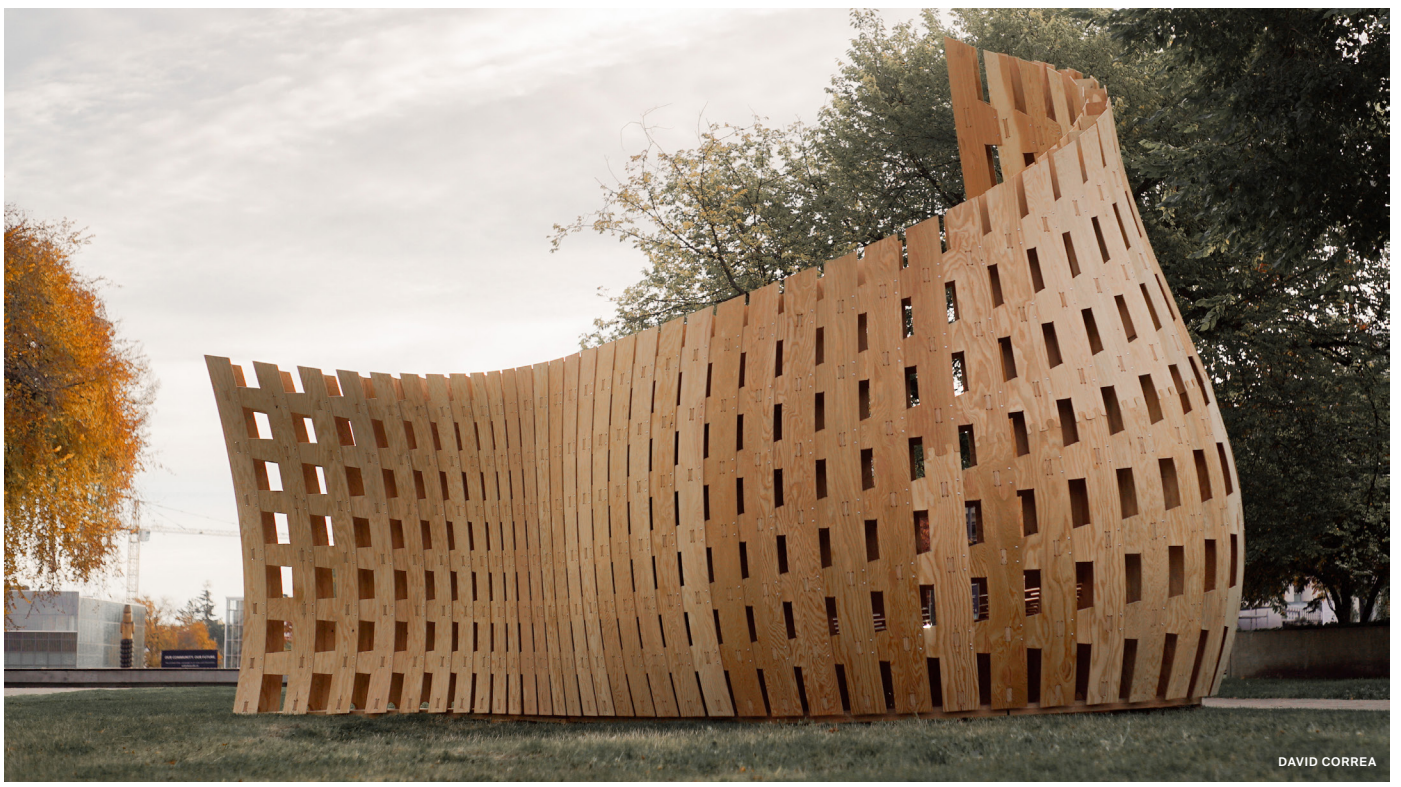
Ateljé Sotamaa, Helsinki

Helsinki-based architect and design director of the Aalto University Digital Design Laboratory Kivi Sotamaa has been on the forefront of digital design and digital manufacturing technologies since the mid-1990s. Though his current interest in timber's structural capabilities is certainly not unique in his native Finland, his singular research to reimagine how wood can be used to build homes has separated him from the pack.

Sotamaa's firm, Ateljé Sotamaa, recently designed the Meteorite, a three-story home near Helsinki constructed entirely of CLT made of locally grown wood, using an organizational strategy he has nicknamed "the misfit." This strategy, as the architect defines it, creates two distinct formal systems to generate room-size interstitial spaces that simultaneously act as insulation, storage space, and housing for the building's technical systems. "Aesthetically," Sotamaa wrote in a 2019 blog post, "the misfit strategy allows for the creation of a large-scale monolithic form on the outside, which addresses the scale of the forest, and an intricate, human scale spatial arrangement on the interior." Sotamaa calculates that the home's CLT slabs have sequestered 59,488 kilograms, or roughly 65 tons, of carbon dioxide from the atmosphere.

The Meteorite was developed and introduced to the client using virtual reality, and Sotamaa hopes to apply other visualization technologies, like AR, to the design and production of additional projects in the near future, allowing builders to see assembly instructions in real time on-site.

AnnaLisa Meyboom



A highly organized workflow was designed to ensure quick on-site assembly for the third Wander Wood Pavilion.

University of British Columbia, Vancouver

In the fall of 2018, 15 of AnnaLisa Meyboom's students at the University of British Columbia (UBC) and over 20 design professionals designed and constructed the third Wander Wood Pavilion, a twisting, latticelike timber structure made entirely of unique components.

By taking advantage of the advanced fabrication resources available at the UBC Centre for Advanced Wood Processing, including a CNC mill and a multiaxis industrial robot, the project was both a learning opportunity for its design team and a demonstration to a broader public that contemporary fabrication technologies can be applied to timber. On one end, the pavilion forms a bench large enough for two people, inviting the public to take a seat and test the material's strength and durability for themselves.

While the pavilion required only three days to fabricate and assemble on-site, a significant amount of time and energy was spent beforehand to ensure its quick construction.
A rigorous workflow balanced an iterative design process with rapid geometric output that accounted for logical assembly sequencing. Every piece of the pavilion was milled into interlocking shapes that were secured by metal rivets.

22 Mapping the Industry

The timber industry has long thrived on its small-scale, local nature due to the sourcing of its materials as well as the limits on project size set by the building code. We're updating our annual map of the schools, organizations, and manufacturers that are leading the way in mass timber research and development. These groups, both in Canada and the United States, innovate quickly, which is why *AN* worked with WoodWorks, an educational arm of the Wood Products Council, and the United States Forest Service's Wood Innovations Program to verify this list.

Schools

1 **University of British Columbia**
Vancouver, British Columbia
The University of British Columbia's campus is home to one of the tallest mass timber buildings in the world, the 18-story Brock Commons Tallwood House. Part of the country's Tall Wood Building Demonstration Initiative, the Tallwood House is a living lab where researchers study the long-term performance of mass timber structures.

2 **Washington State University**
Pullman, Washington
At Washington State University's Composite Materials & Engineering Center, students get hands-on experience with the design, fabrication, and construction of CLT panels. The center has partnered with construction company Katerra to design and test mass timber systems and create regulations for their use.

3 **Oregon State University**
Corvallis, Oregon
The Oregon State University College of Forestry is home to the TallWood Design Institute, a collaboration with the university's schools of engineering and design. The College of Forestry was also awarded a USDA grant in 2018 to study the effects of moisture on mass timber structures and, to unite pedagogy and place, opened the Oregon Forest Science Complex, whose design incorporates extensive use of CLT, last fall.

4 **Colorado School of Mines**
Golden, Colorado
Working in collaboration with industry partners and other schools on this list, researchers at the Colorado School of Mines are using a $1.5 million National Science Foundation grant to develop mass timber structures designed for seismic performance in earthquake-prone regions. With the goal of proving that sustainable timber buildings are just as resilient and safe as those built with more conventional materials, the group has successfully tested a two-story building on University of California San Diego's "shake table," and plans to test a full-scale ten-story structure in 2021 as part of the NHERI Tall Wood Project.

Organizations

1 **Forestry Innovation Investment**
Vancouver, British Columbia
Publicly owned and funded by the provincial government, Forestry Innovation Investment is British Columbia's wood products marketing agency. The agency works to sustain the national timber industry by developing new market segments and export markets, advancing wood use and construction technologies, and marketing outreach to position forest products.

2 **APA — The Engineered Wood Association**
Tacoma, Washington
This nonprofit trade association pushes the structural wood industry forward by representing and regulating engineered wood manufacturers in North America, and by promoting innovative solutions and improved practices.

3 **Softwood Lumber Board (SLB)**
West Linn, Oregon
Established to promote the use of softwood lumber in U.S. construction projects, the SLB funds several programs, organizations, and initiatives, including the U.S. Tall Wood Building Prize Competition, which is organized by the USDA, as well as many of the other organizations mentioned on this list.

4 **Think Wood**
West Linn, Oregon
Think Wood's objectives are outreach and education. In addition to its online research library, which includes continuing education units related to tall wood and mass timber, the organization identifies and publicizes projects and professionals that are using North American softwood products in innovative ways.

5 **Forest Business Network**
Missoula, Montana
The Forest Business Network (FBN) helps businesses that manufacture, design, and sell products made from both hardwood and softwood. FBN offers timber consulting services based on its expertise in "underutilized timber and woody biomass," which include business assistance, grants, and custom reports.

Manufacturers

1 **StructureCraft**
Abbotsford, British Columbia
(CLT, DLT, NLT, glulam beams, LVL, LSL, PSL)
StructureCraft is an engineer-led construction firm that creates a multitude of mass timber products, including its signature DowelLam, the first all-wood panel manufactured without glue or nails in North America.

2 **CutMyTimber**
Portland, Oregon
(timber product processing)
According to the USFS, CutMyTimber is among the top timber product processors in the United States—a growing subsector in the field of manufacturing. With offices in Portland and North Vancouver, Canada, the company uses CNC machines to create customized products or building systems for projects around the world.

3 **Freres Lumber**
Lyons, Oregon
(mass plywood panels)
Freres Lumber's mass plywood panels (MPPs) are a composite, veneer-based engineered wood product that can be produced using 20 percent less wood than CLT panels.

4 **Rosboro**
Springfield, Oregon
(glulam, LVL, parallel strand lumber)
Rosboro is the largest producer of glulam beams in North America. Other than its diverse range of Douglas fir glued-laminated timber products, it also produces sawn lumber and studs made from western regional tree species. All manufacturing takes place in two locations in Oregon: Springfield and Veneta.

5 **D.R. Johnson**
Riddle, Oregon
(CLT panels, glulam beams)
D.R. Johnson was the first company in the U.S. to obtain ANSI certification to manufacture CLT panels. An affiliate company, Riddle Laminators, has been making glulam beams from Douglas fir and Alaskan Yellow Cedar for over 50 years.

6 **Vaagen Timbers**
Colville, Washington
(CLT, glulam beams)
Vaagen Timbers uses high-tech milling machines to produce products at its Colville, Washington, facility, as well as two other sites in Usk, Washington, and Midway, British Columbia. It uses lumber-scanning technology and a portable HewSaw machine to handle underutilized small logs.

7 **Katerra**
Spokane, Washington
(CLT panels, glulam beams)
Katerra recently opened a 250,000-square-foot mass timber manufacturing facility in Spokane, Washington. Its catalog of products, which are developed and tested in collaboration with the Composite Materials & Engineering Center at Washington State University, includes CLT panels for walls, floors, and roofs.

8 **Western Archrib**
Edmonton, Alberta
(glulam)
From two facilities in Boissevain, Manitoba, and Edmonton, Alberta, Western Archrib designs and manufactures glued-laminated structural products, including beams, columns, studs, and decking. It also provides custom fabrication with 3D modeling software for CNC framing, steel connections, and finishes.

9 **SmartLam North America**
Columbia Falls, Montana; Dothan, Alabama
(CLT panels)
SmartLam produces CLT panels for floors, walls, roofs, and elevator shafts, and supports its products with design, engineering, and consulting services. The company owns a facility in Montana and recently acquired Southern Pine lumber factory in Dothan, Alabama, formerly owned by Florida-based International Beams.

10 **Euclid Timber Frames**
Charleston, Utah
(ICLT panels)
Euclid manufactures interlocking cross-laminated timber (ICLT) for walls and roofs. Unlike CLT, ICLT panels are produced without the use of fasteners or adhesives, relying instead on tongue-and-groove and dovetail joints.

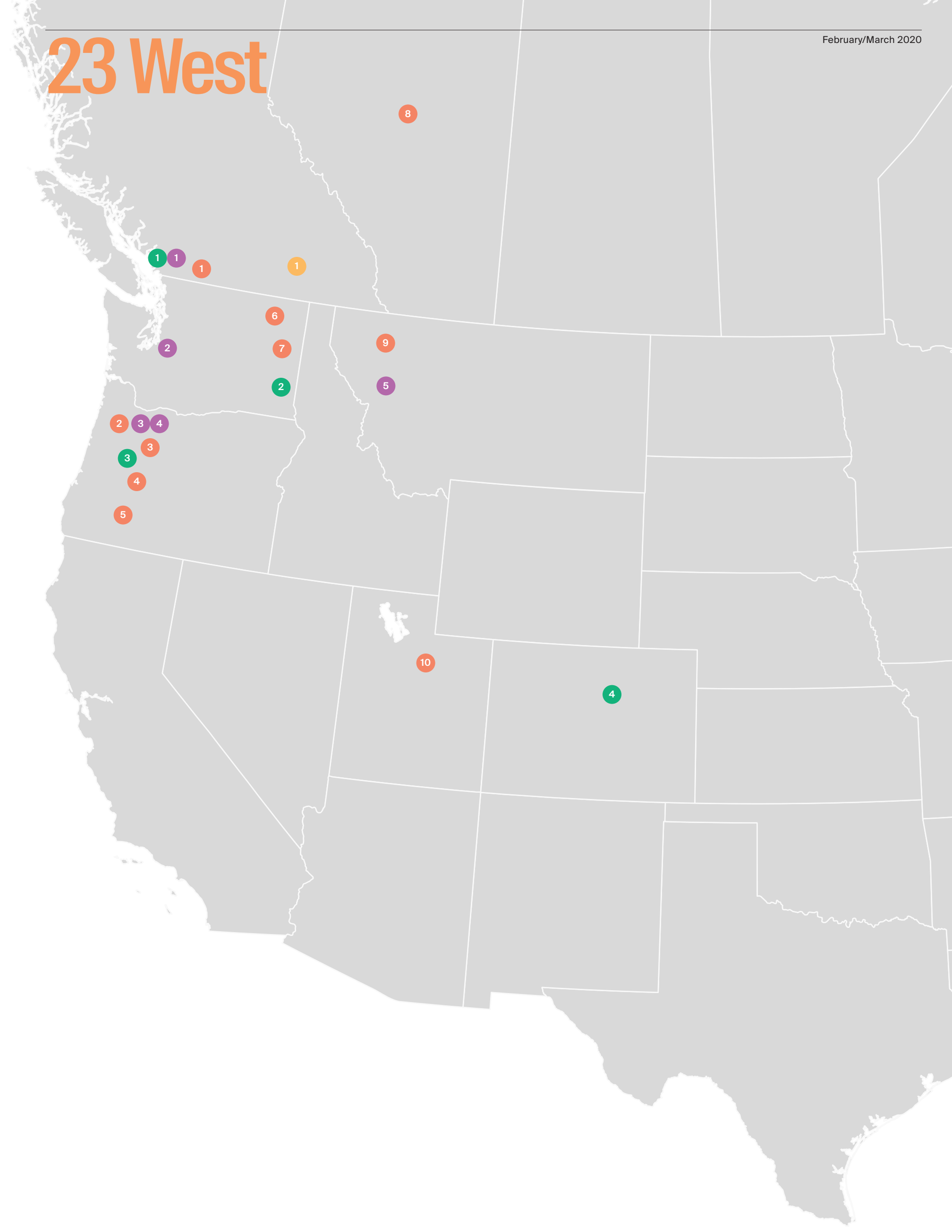
Planned Factories

1 **Kalesnikoff Lumber**
South Slocan, British Columbia
(CLT panels, glulam beams)
Kalesnikoff Lumber is opening a CAN$35 million plant in Slocan, British Columbia. The 110,000-square-foot factory is the 81-year-old company's first foray into mass timber.

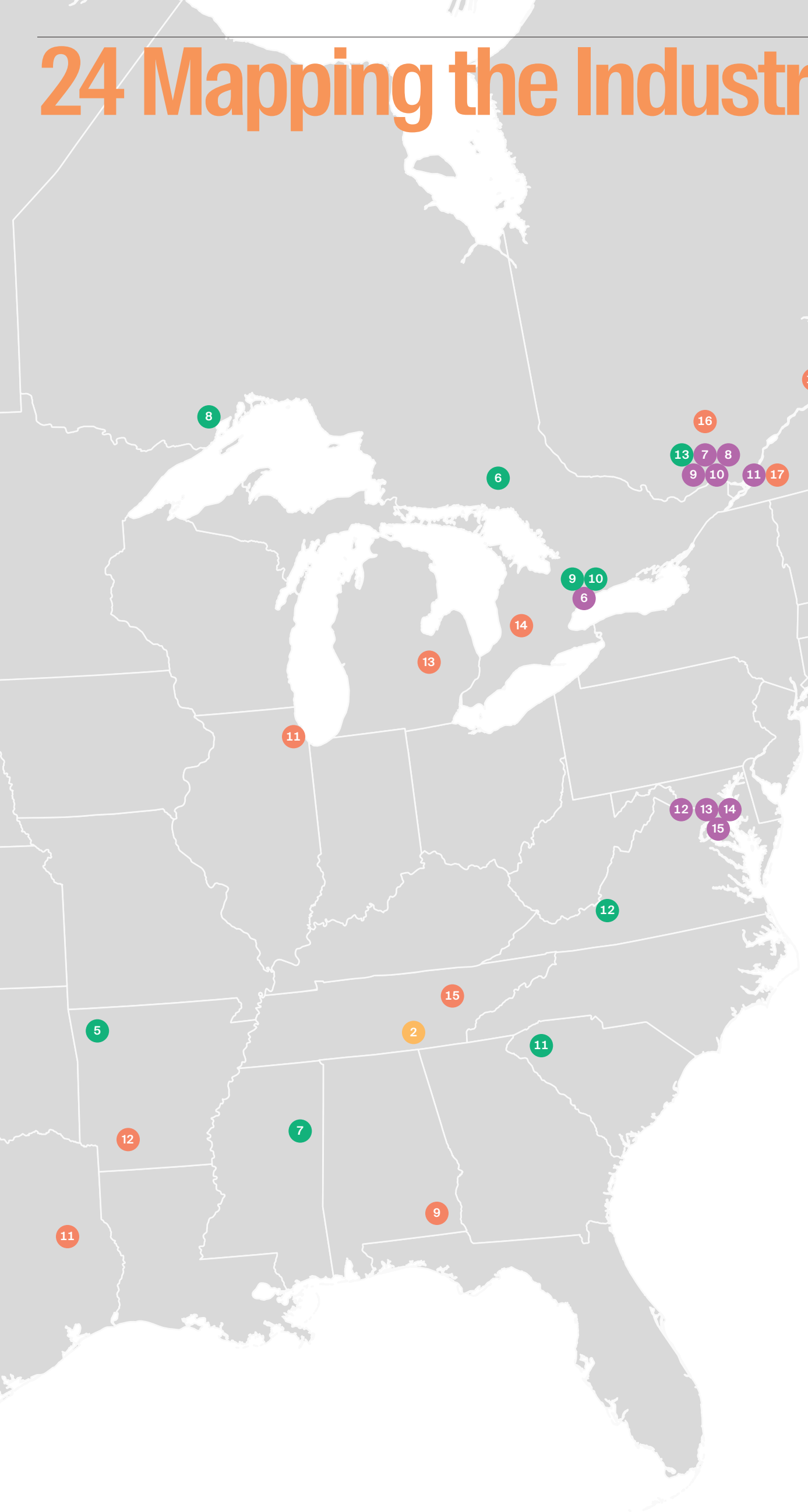
Top 10 Mass Timber Projects in Design and Construction in the U.S. for 2019

State	In Design	In Construction/Built
California	68	32
Washington	44	28
Texas	37	17
Oregon	23	25
Massachusetts	25	13
North Carolina	22	13
Florida	18	15
New York	24	6
Colorado	11	14
South Carolina	11	9
Wisconsin	12	8

23 West



24 Mapping the Industry



Schools

5 University of Arkansas
Fayetteville, Arkansas
The Fay Jones School of Architecture and Design at the University of Arkansas recently opened its new mass timber dormitory by Boston-based architect Leers Weinzapfel Associates. Peter MacKeith, dean of the school, is spearheading the Wood Lab, which specializes in building and designing with wood. It is part of the school's FAY Fabrication Laboratories.

6 Laurentian University
Sudbury, Ontario
In 2018, Laurentian University's McEwen School of Architecture completed a new building with an entire wing constructed of cross-laminated timber. The school, founded in 2013, places an emphasis on both timber architecture design and hands-on knowledge of wood craftsmanship. The school hosted the first International Wood Educators Conference in September 2019.

7 Mississippi State University
Mississippi State, Mississippi
A fourth-year undergraduate studio at Mississippi State University, TIMB(R): Timber Innovations for Mississippi Buildings Reimagined, asks students to study the benefits of innovative wood product design and building methods. Established in 2016 and funded in part by the Sustainable Forestry Initiative, the Mississippi Forestry Foundation, and Weyerhaeuser, the studio has students compete to design plans for timber structures across the country. The class also works in tandem with the Sustainable Bioproducts major within the College of Forest Resources to develop and test new products.

8 Lakehead University
Thunder Bay, Ontario
A department within Lakehead University's Faculty of Natural Resources Management, the school's forestry program focuses on the technology behind contemporary forest management. Currently, the university is collaborating with the province of Ontario by mapping trees of the region's woodlands.

25 East

9 George Brown College
Toronto
The Arbour, an upcoming 14-story academic building on George Brown College's campus, will be made of mass timber sourced within Canada. The building, set to begin construction in 2021, will house the Tall Wood Research Institute, a forum for students and faculty to research and develop ideas related to mass timber construction. The school offers undergraduate- and graduate-level certificates in construction management, and its faculty researches wood technology and green building, among other topics.

10 University of Toronto
Toronto
The University of Toronto is currently building a Patkau Architects and MJMA–designed timber-and-concrete hybrid tower. The tower, partially funded by Canada's Tall Wood Building Demonstration Initiative, will reach a height of 14 stories. Once completed in 2022, the building will feature a research laboratory for Canada's Mass Timber Institute.

11 Clemson University
Clemson, South Carolina
Clemson University's multidisciplinary Wood Utilization + Design Institute was created to leverage the school's programs in architecture, engineering, forestry, and construction to design and advocate for wood structures. In late 2018, the university's school of architecture patented the result of multiyear research into Sim[PLY], an innovative wood construction system that the school has already used to build three structures.

12 Virginia Tech
Blacksburg, Virginia
Researchers at Virginia Tech have been experimenting with mass timber for more than a decade. In 2018, faculty and students at the School of Architecture + Design designed a CLT train-watching tower as part a tourism development plan in Radford, Virginia. Their project was completed in September 2019 and recognized by the AIA Blue Ridge design awards.

13 University of Ottawa
Ottawa
The University of Ottawa's Faculty of Engineering provides a fourth-year undergraduate class focusing on timber design. In total, over 1,000 alumni have received training in timber construction.

14 University of Massachusetts Amherst
Amherst, Massachusetts
Within the Building and Construction Technology department at the University of Massachusetts Amherst, a special division researches the design and use of hybrid wood-concrete composite systems. Fittingly, its research is conducted inside the largest CLT academic building in the United States, designed by Leers Weinzapfel Associates.

15 Yale University
New Haven, Connecticut
The Yale School of Architecture offers a joint degree with the university's School of Forestry & Environmental Studies that focuses on sustainable architecture alongside ecology and policy. The two schools have also partnered with local architecture firm Gray Organschi to support the Timber City research initiative, which is funded by the United States Department of Agriculture (USDA).

16 University of Maine
Orono, Maine
The University of Maine is working with its home state to revitalize old industrial mills by attracting a new mass timber industry. Its efforts include the construction of the Maine Mass Timber Commercialization Center, funded in part by a federal grant, as well as extensive research by students at the university's Advanced Structures and Composites Center, which recently tested a hybrid CLT beam made from two native tree species.

Organizations

6 Mass Timber Institute (MTI)
Toronto
The MTI is a Canadian consortium of public and private institutions, mainly universities. The MTI researches, develops, and promotes high-rise wood construction across the country. Current projects include the The Arbour in Toronto, a 14-story concrete-and-timber hybrid building at George Brown College.

7 Canadian Forest Service
Ottawa
The Canadian Forest Service is an arm of the Canadian federal government department Natural Resources Canada. Operating from a central office in Ottawa and six other research facilities throughout the country, the service fosters environmental leadership, sustainable forest management planning and policies, and ongoing scientific research.

8 Canadian Wood Council
Ottawa
Much like its American counterpart, the Canadian Wood Council represents wood product manufacturers, develops design and technical standards, and works to ensure its resources are available to professional and academic communities.

9 Forest Products Association of Canada
Ottawa
The Forest Products Association of Canada represents the country's paper, pulp, and wood industries nationally and internationally. They specialize in environmental leadership, forestry management practices, product innovation, workforce advocacy, and other economic and trade efforts.

10 Wood *WORKS!*
Ottawa
Wood *WORKS!* was created by the Canadian Wood Council to increase the use of wood construction for mid-rise and tall buildings in Canada. Wood *WORKS!* is a resource for education, training, and technical support for building tall with timber.

11 FPInnovations
Pointe-Claire, Quebec
FPInnovations, active in Quebec City, Montreal, and Vancouver, Canada, is a nonprofit timber construction research institute covering topics like forestry management and construction products. Currently, FPInnovations has a team devoted to advanced timber building systems, finding efficient acoustical and structural solutions for projects of every scale.

12 American Wood Council (AWC)
Leesburg, Virginia
AWC is the leading voice for America's structural wood products industry. In addition to advocating for public policies that benefit the wood industry, the AWC promotes opportunities for wood products and mass timber in codes and regulations. AWC also provides American National Standards Institute–accredited design specifications along with education and training on proper wood design and construction. The AWC is partially funded by the Softwood Lumber Board.

13 American Forest & Paper Association (AF&PA)
Washington, D.C.
AF&PA advances public policies and funds research to support the production of wood products in the U.S., particularly pulp, paper, and packaging. It also supports wood manufacturing across the globe and promotes sustainable growth of the U.S. forestry industry. It has collected data on the resilience of mass timber to promote acceptance of wood building systems.

14 United States Forest Service (USFS)
Washington, D.C.
As part of its mission to manage and protect national forests and grasslands, the USFS works with public and private agencies to build markets for sustainable wood products. One such product is CLT produced from dead and dying trees, the harvesting of which could help control the spread of forest fires. The Wood Innovations Program provides funding for projects utilizing CLT and other wood materials.

15 WoodWorks: Wood Products Council
Washington, D.C.
WoodWorks is dedicated to providing architecture, engineering, and construction professionals with free technical support in designing and constructing commercial and multifamily wood buildings, including mass timber structures. WoodWorks also helps educate professionals about wood construction through symposiums, workshops, lunch-and-learns, and other events. WoodWorks is partially funded by the Softwood Lumber Board and US Forest Service.

Manufacturers

11 Lion Lumber
Phoenix, Illinois; Lufkin, Texas
(CLT panels and CLT mats)
Formerly known as Sterling Lumber Company, Lion Lumber is a 70-year-old family company that manufactures cut-to-length lagging lumber, industrial lumber for transportation project shielding, and pallets and skids for shipping and unloading. Specializing in CLT, Lion Lumber also offers design and build services for custom work. Last year, it opened a massive new facility in Lufkin, Texas, where it continues to make its signature TerraLam mat.

12 Texas CLT
Magnolia, Arkansas
(CLT mats)
Texas CLT is an investor group that reopened the defunct Arkansas Laminating mill last year in Magnolia, Arkansas, where it produces CLT mats made from southern pine and Douglas fir.

13 Timber Systems
Lapeer, Michigan
(glulam, sawn timber)
Timber Systems installs, fabricates, and designs mass timber structural components. With a wide array of timber products, its product catalog includes glulam and solid sawn timber, decking, bridges, and shelters.

14 Guardian Structures
St. Marys, Ontario
(CLT, NLT, mass timber panels)
Guardian Structures manufactures glulam, cross-laminated timber, nail-laminated timber, decking, hybrid mass timber panels, and finger joints. With a portfolio of predesigned homes, multiuse units, and other structures, it also builds customizable mass timber buildings.

15 Sauter Timber
Rockwood, Tennesee
Established in 2002, Sauter Timber is the first wood component joinery service to set up shop in North America. The organization expanded its offerings in 2010 to include CNC services for mass timber products like CLT and glulam, as well as other timber frame components, SIP panels, and hybrid home and log home components.

16 Element5
Ripon, Quebec
(CLT, NLT, LVL, glulam beams)
Element5 produces the widest format panels of any CLT plant in North America. Its macro. CLT product is 12 feet wide by 24 feet long and ranges from 2 to 16 inches thick. The company also makes a thin panel product called nano.CLT and a curved panel called free.CLT.

17 Nordic Structures
Montreal
(I-joists, CLT panels, glulam beams)
Nordic Structures sustainably manufactures industrial-grade CLT panels, I-joists, and glulam beams.

18 Structure Fusion
Saint-Augustin-de-Desmaures, Quebec
(glulam, hybrid timber beams, fabrication)
Structure Fusion is a Canadian company that specializes in wood construction. Acting as a structural engineer, the company partners with Simonin to design and manufacture adapted wood products, including its patented Sapisol and Resix systems.

19 Bensonwood
Walpole, New Hampshire
(CLT, NLT, glulam, fabrication)
Bensonwood collaborates with architects and engineers to build small and large projects in mass timber and CLT from suppliers like Nordic Structures. A special division uses off-site manufacturing to build timber frames with CNC milling machines that are assembled by hand.

Planned Factories

2 Texas CLT
Jasper, Tennessee
(CLT panels)
The company recently announced plans to open a new plant in southeast Tennessee, near Chattanooga, where it will produce structural CLT.

3 LignaTerra
Lincoln, Maine
(CLT panels, glulam beams)
LignaCLT Maine is LignaTerra's Northeastern offshoot, which it intends to become the state's first CLT and glulam manufacturer. The company had planned to open a 300,000-square-foot facility in Millinocket, Maine, last year but instead has set its sights on Lincoln.

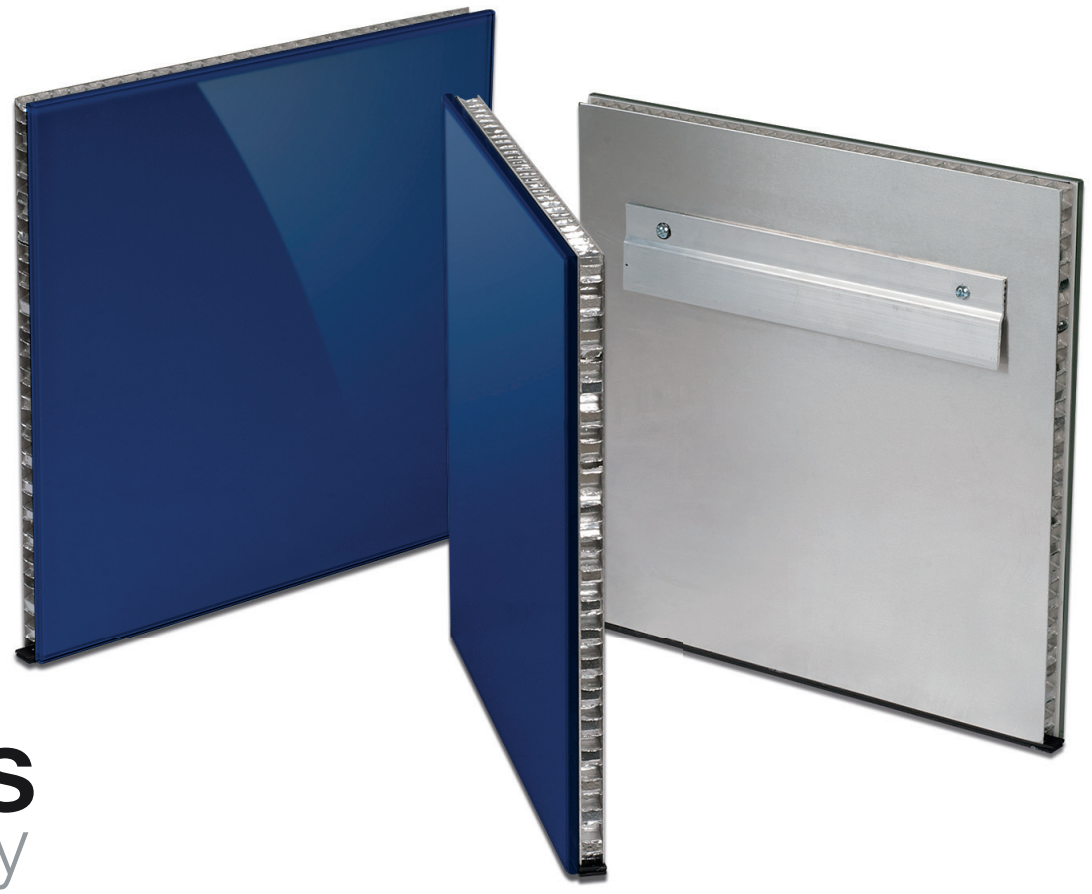
4 SmartLam North America
TBD, Maine
In 2018, SmartLam announced plans to open a factory in Maine in hopes of becoming the second producer of CLT in the state, after LignaTerra. The project has been delayed because of funding issues.

Attending the AIA Show in Los Angeles?
Do you need some Continuing Education Units?

Glass Processing 101 & Factory Tour (4 units) | May 13 & 14, 2020

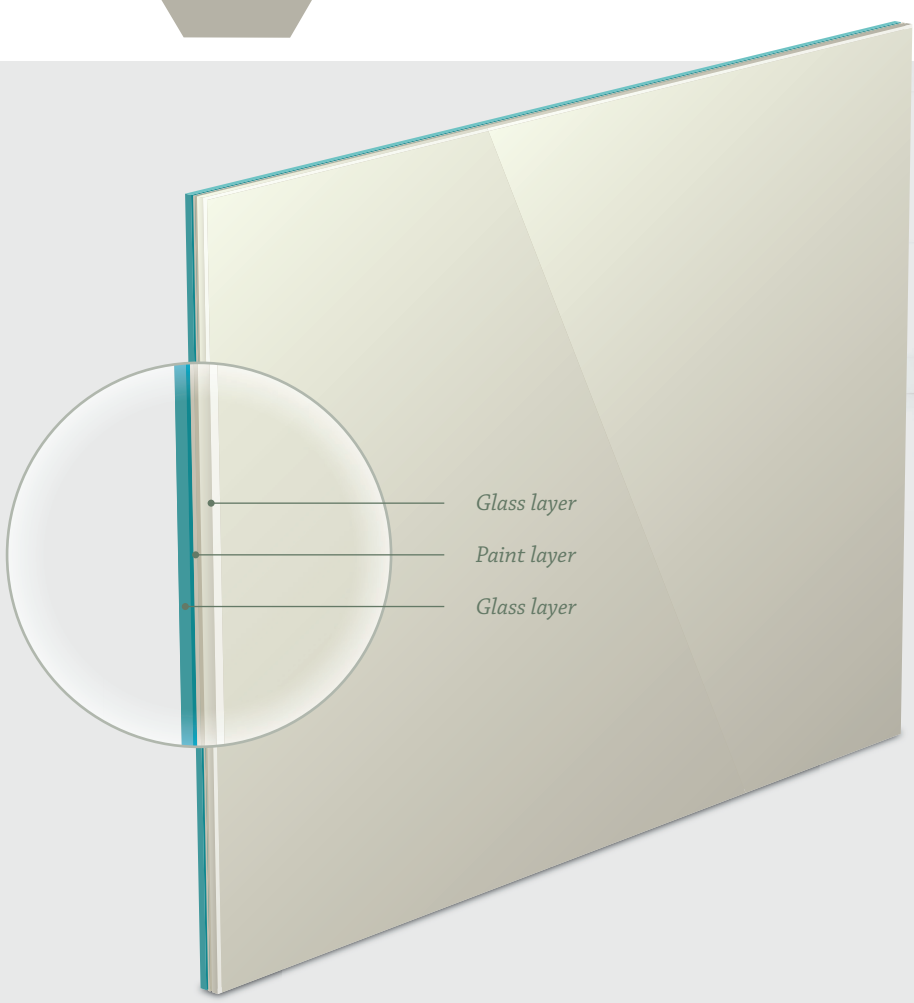
Sign up for a tour of one of the most advanced glass manufacturing facilities in the USA.
Transportation from and to Los Angeles Convention Center provided. Limited space available.
Contact us for more information or to sign up at **glasstour@pulpstudio.com**

Aesthetic. Durability. Flexibility. Safety. All in one light weight body.



Mechanical connections to the wall or a ceiling can improve overall strength and safety in many installations, while still maintaining a minimal weight per square foot. Pulp Studio's Light Glass Technology untilizes aluminum honeycomb core with aluminum facings which add rigidity to even the thinnest glass material. The material becomes a laminated composite that complies with all standards as governed by ASTM C 1172 and CPSC 16CFR 1201.

Light Glass Technology



Pulp Studio's PINCAB utilizes our Pintura glass, environmentally friendly color glass sheets, laminated to another sheet of glass with water-based color coating on the the inside surface of the lamination, allowing the back surface of glass smooth for gluing to another substrate for maximum adhesion. PINCAB complies with the requirements of Category II safety standards, making it a perfect choice for elevator applications.

PINCAB

PULPSTUDIO
www.pulpstudio.com

2100 W. 139th St. Gardena, California 90249
Tel: 310-815-4999 Fax: 310-815-4990
Email: sales@pulpstudio.com

Wood Construction

From the biggest to the tallest, timber is growing (no pun intended) on everyone. We asked engineers what they are excited about, dove deep into some of the highest-profile projects, and examined all the important products that make timber construction possible, from fasteners to non-combustible cladding. By Gabrielle Golenda

COURTESY SMARTLAM

Timber-rific

Engineers describe their most innovative timber projects.

***AN* surveyed some of the leading practices in timber structure and facade engineering about the most innovative projects they worked on over the past year. Their responses highlight advanced applications of timber, ranging from a hybrid tower underway in Canada to greenhouse domes popping up in China.** By Matthew Marani


MORIYAMA & TESHIMA ARCHITECTS


MORIYAMA & TESHIMA ARCHITECTS

Paul Fast
Founding Partner, Fast + Epp

Perhaps the most groundbreaking project we have been working on this year is The Arbour, a new ten-story building for George Brown College in Toronto (top). It features a novel structural system consisting of the slab-band arrangement commonly used in concrete construction, but replaces most of the concrete with mass timber. Composite CLT-concrete slab bands with an overall thickness of 15.5 inches span 30 feet between large 1.4-foot-by-3.9-foot timber columns, and infill 6-inch-thick CLT panels clear span 15.5 feet between the slab bands. Central stair and elevator cores consisting of steel columns and diagonal bracing provide lateral resistance for the building. The end result is a primarily timber construction floor system that offers a thickness and flat soffit comparable to concrete construction but with a sharp reduction in both embodied carbon and construction time. The exposed timber flooded by ample daylight will also create a wonderful physical work environment for students and faculty (above).

Eric McDonnell
Principal, Holmes Structures

I have been lucky enough to work on a number of innovative mass timber projects this year. These include Redfox Commons [featured on page 13], designed by LEVER, which utilized salvaged timbers to create a connecting building between two refurbished historic warehouses; District Office, a six-story mass timber building designed by Hacker that is the future home of our Portland office; NIR Center (bottom), designed by Hennebery Eddy, a proposed ten-story hybrid structure of mass plywood floor panels and steel DELTABEAMs utilizing the new Type IV-B heavy timber building regulation approved for the 2021 International Building Code; and the Adidas North American Headquarters expansion project, also by LEVER, which is using a unique hybrid structure of mass timber floor cassettes and precast concrete beams and columns (below). The most innovative of all would likely be Katerra's Catalyst Building in Spokane, Washington, the first project to use CLT panels made in Katerra's new manufacturing facility. This five-story office and classroom building is constructed almost entirely of mass timber, including CLT ribbed floor panels, glulam beams and columns, and CLT cladding panels, along with the first use of CLT shear walls utilizing buckling-restrained braces (BRBs) as ductile hold-down elements.


COURTESY HOLMES STRUCTURES


HENNEBERY EDDY ARCHITECTS


MORGAN DOYLE

Chris Carbone
Company Steward and Engineer, Bensonwood

Two projects come to mind: the River Road Barn (above) by Sylvia Richards and Christopher Smith, and Haus Gables by Jennifer Bonner of MALL [featured on page 36]. Richards and Smith used a cross-laminated timber (CLT) floor plate and shear walls with glulam joists and concrete as the podium for the elevated main frame, which was built with small black spruce glulams. The barn offers a 34-foot-by-46-foot clear span with 13-foot-6-inch head height below a stainless tie. A semi-rigid moment-resisting joint was implemented at the rafter eave connection. Behind the elegant diagonal siding and bracing, bronze mesh keeps the bugs out.

Bonner's house features playful crashing gables to span a narrow building, where the reflected plan of the folded plate roof defines the floor plan below. In places, the CLT roof plates even reach down through interior walls to hold up the second floor. All of the structural components—walls, roof, and second floor—are built with European CLT. The stair stringer and guardrails are also built from structural CLT. Specifications and communication about predrill angles and locations for the crew installing the connections from the roof through to the walls below were challenging, but fun!

Lucas Epp
Head of Engineering, StructureCraft

One of this year's most notable projects is the Taiyuan Botanical Garden in the Shanxi province of China, by Delugan Meissl Associated Architects (DMAA), out of Vienna (below). This project comprises three domes functioning as greenhouses for exotic plants. In each dome, a slender timber lattice grid shell supports the glass-clad enclosures. The largest dome spans almost 300 feet, making it the longest clear-span timber grid shell of its type in the world.

StructureCraft is the structural engineer and builder for these three timber grid shells, working closely with DMAA to create a beautiful but efficient design, using the latest in parametric geometry and structural optimization techniques in Grasshopper and Rhino.

All three parabolic grid shells comprise double-curved glulam beams, arranged in two or three crossing layers. When viewed from above, the timber structures resemble seashells, with the primary members closely bunched on one side and then fanned out across the surface of the domes. This complex geometrical arrangement means that every one of the members is unique. Digital fabrication techniques were key to realizing these structures, automatically generating the g-codes and assembly information for the more than 250,000 unique pieces and fasteners in them. The engineering team also carried out significant full-scale structural testing on the unique hidden connections used throughout the domes, working with our own structural testing lab as well as Tongji University.

The project is still under construction, with the structure of all three domes now complete.


STRUCTURECRAFT


RICKY JONES

Andrew Lawrence
Associate Director and Global Timber Specialist, Arup

We enjoy experimenting with new wood-based materials and were lucky to be invited by Matthew Barnett Howland, Dido Milne, and Oliver Wilton to collaborate on their Cork House in which interlocking cork blocks provide structure, insulation, a weather barrier, and finishes (above). The low density of the cork presented several engineering challenges—we used the weight of the skylights to hold down the cork roof pyramids under strong winds, and we incorporated several layers of timber ring beams to hold the pyramids in shape. Utilizing the same material for both structure and insulation was not without its challenges, as well; the denser the blocks, the stiffer they became, but the less effective they were as insulation. It was always going to be a careful balance between the different performance requirements.

Anne Monnier
Principal, KPFF

While we completed several mass timber buildings over the past five years, the sheer quantity of projects getting to the construction stage last summer was a new record. Two projects in Portland, Oregon—the Adidas North American Headquarters, designed by LEVER Architecture, and the District Office, designed by Hacker Architects (below)—saw their structural frames go up this past year. The District Office features an innovative optimized, fiber-count mass timber frame that utilizes a tight colonnade column layout in one direction with long-span glulam beams. Not only does it allow for a clean, fully exposed, one-hour fire resistance–rated mass timber frame for maximum daylighting, but it also enables organized routing of MEP systems. This is further developed by providing chases between CLT panels to allow for smaller distribution lines such as conduits and sprinklers. The Adidas expansion encompasses a more traditional column layout with double-glulam girders in the South Building and precast concrete girders in the North Building, both accommodating MEP routing through and/or over the girders coupled with a panelized CLT and glulam beam floor system. Speed of construction and fewer pieces to handle were key drivers on this fast-track project.


HACKER ARCHITECTS

University of Arkansas Adohi Hall

Architect: Leers Weinzapfel Associates
Mackey Mitchell Architects
modus studio
Location: Fayetteville, Arkansas

Landscape architect: OLIN
Civil engineering: Development Consultants Incorporated
Contractor: Nabholz
Structural engineer: Engineering Consultants, Inc.
Timber consultant: Equilibrium Consulting
MEP and fire engineer: Bernhard TME
Sustainability: Entegrity
Posts and beams: Holzpak European spruce-pine-fir glulam
Floor and roof slabs: Holzpak European spruce-pine-fir 7-ply CLT
Structural connectors: Rothoblaas
Rainscreen: Morin metal panel
Brick: Glen-Gery Carbon Black Flashed
Exterior insulation: ROXUL CAVITYROCK semi-rigid mineral wool
Roofing membrane: Firestone UltraPly TPO XR Membrane
Roofing insulation: Firestone ISO 95+ GL
Windows: Traco TR-6800
Curtain wall and doors: Kawneer 1600
Glazing: Solarban 60 and 70
Exterior finishes: Benjamin Moore Arborcoat on exposed exterior wood and Sherwin-Williams Sher-Cryl HPA on exposed metal

Adohi Hall, a 708-bed coed dorm designed by Leers Weinzapfel Associates, Mackey Mitchell Architects, and modus studio for the University of Arkansas, is the largest cross-laminated timber (CLT) building in the United States. The name of the project honors the Cherokee, who passed near the site while being forced to march the Trail of Tears. *Adohi*, the Cherokee word for "woods," was chosen in consultation with citizens of the Cherokee Nation and references the sustainably sourced wood used in the CLT construction.

Completed in 2019, Adohi is a distinctive new gateway to the University of Arkansas in Fayetteville. Its series of interconnected timber structures and courtyards rests on a sloping, 4-acre site at the southern edge of the campus. A serpentine band of student rooms connected by a ground-level passage defines three distinctive courtyard spaces for interactive learning in architecture, design, and other arts. The 202,027-square-foot building includes classrooms, maker spaces, performance spaces, administrative offices, and faculty housing. Advanced timber technologies, like CLT panels and glulam beams and columns, were integrated throughout to reduce the carbon footprint of such a large and complex building.

The building's interiors celebrate the timber structure. Exposed structural wood ceilings are used in the student rooms, study rooms, floor lounges, and ground floor common spaces. The project's main gathering space, the Cabin, also features a wood ceiling and trusses that span the full width of its lounge spaces. Outside, a light metal jacket of zinc-toned panels with copper-toned and white accents covers bars of living space that seem to float above the glass-clad base and the landscape below.
Eric Baldwin


TIMOTHY HURSLEY


TIMOTHY HURSLEY


TIMOTHY HURSLEY

TIMOTHY HURSLEY

Top: The entrance lobby, along with the rest of the building, features irregular but simple shapes.

Above left: Timber trusses structure the ceiling of a common space on the ground floor.

Above right: A timber ceiling covers a breezeway under a housing bar.

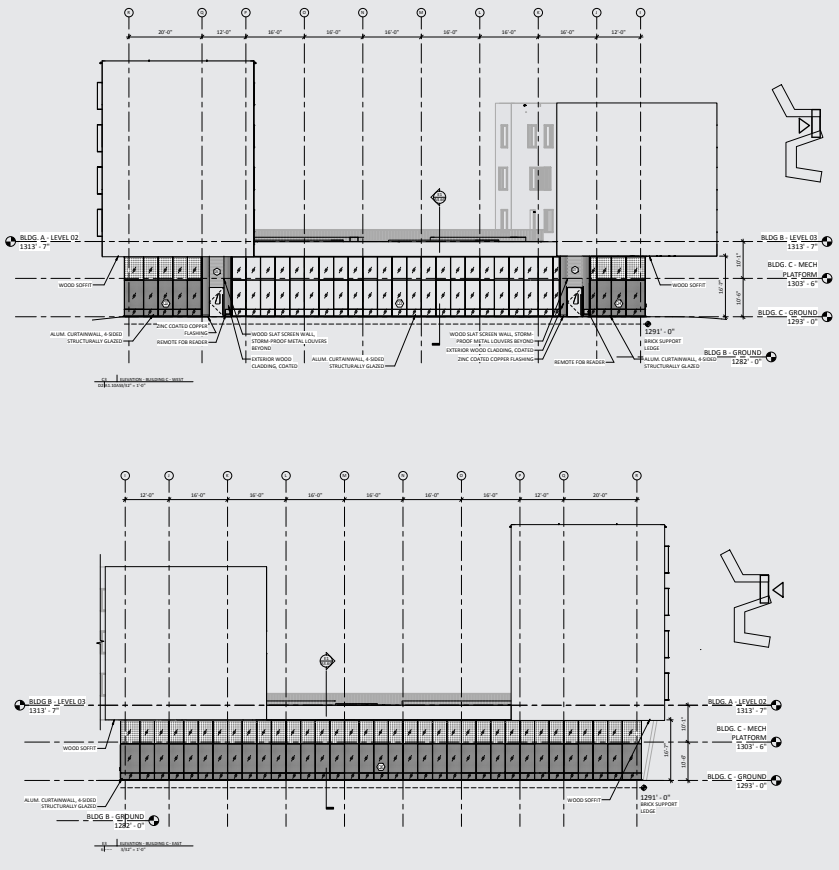
Left: Timber columns are used on the ground floor.

Facing page, top: The building features two kinked housing bars that are connected by a ground-floor space.

Facing page, below left: As shown in the elevations, the ground level that connects the two housing bars is clad in glass.

Facing page, below right: The facade features metal cladding with accents in copper and white tones.

TIMOTHY HURSLEY



COURTESY LEERS WEINZAPFEL ASSOCIATES

TIMOTHY HURSLEY

The Pavilion at Great Northern Way

Architect: Perkins and Will
Location: Vancouver, British Columbia, Canada

Timber fabricator: Spearhead
Glass fabricator: Blackcomb Facade Technology
Glazing: Guardian SunGuard
Aluminum manufacturer: Alucobond
General contractor: Ledcor Group
Timber: Custom laminated strand lumber and glulam

The Pavilion at Great Northern Way, a florid timber, steel, and glass structure designed by Perkins and Will and fabricated by Canadian timber specialist Spearhead, anchors a new public plaza in the Mount Pleasant neighborhood of Vancouver, British Columbia. The 2,000-square-foot space, which was completed in 2019 and will be home to a coffee shop, abuts the Perkins and Will–designed South Flatz office block and the newly constructed campus of the Emily Carr University of Art + Design.

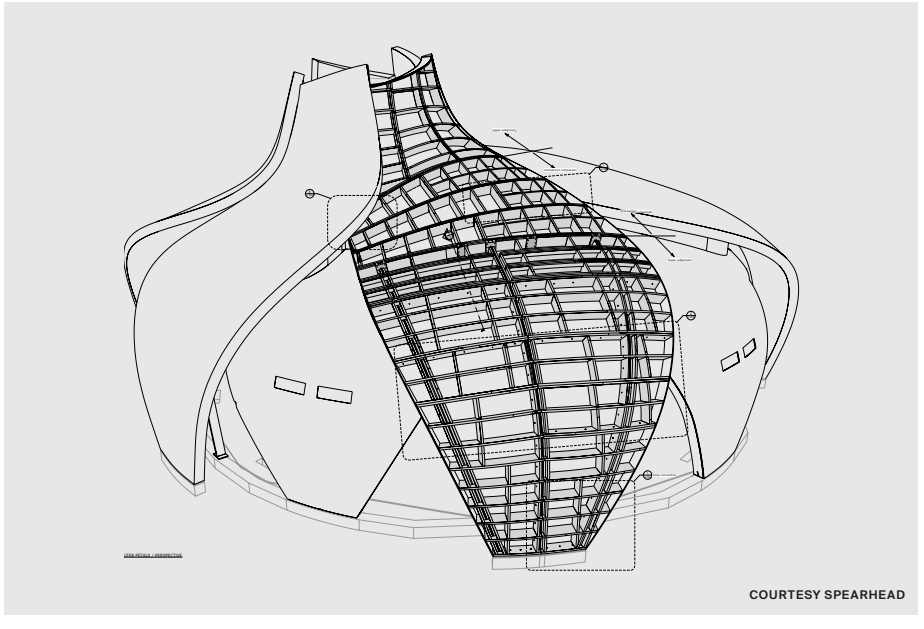
The primary elements of the pavilion are ten overlapping curved "petals" clad in bright-red aluminum composite shingles. The petals are just over 30 feet tall and frame a central glazed oculus. Initially, the architects sought to achieve the flowing form with nail-laminated timber panels—stacked dimensional lumber held together with nails—shaped by 5-axis CNC sculpting. With a budget of $1.4 million, however, this method proved cost prohibitive. Instead, Spearhead developed a waffle framing model built of economic laminated strand lumber and glulam sculpted with a 3-axis CNC machine, an approach that significantly reduced the volume of material required for the pavilion and facilitated the straightforward installation of insulation and MEP infrastructure.

Streamlining the broad contours of the pavilion did not diminish the project's hybrid, kit-of-parts complexity. The shear wall system consists of curved plate steel reinforced with glulam on either side, while the slender profile of the upper roof layer relies on CNC-cut plate steel columns laterally supported by engineered wood components. Both the roof diaphragm and the shear wall system are sheathed in plywood; moments of extreme curvature are decked with layers of thin plywood laminated together. Narrow strips of birch plywood were applied to the interior and overlap as curved drop siding. In total, there are approximately 6,950 custom CNC-cut wood components, 875 custom CNC structural steel parts, and 1,350 Simpson brackets.

Blackcomb Facade Technology, a frequent Spearhead collaborator with a particular expertise in complex assemblies and hybrid structures, handled the five curved glazed bays for the pavilion using a RAICO Therm+ A-I system with Guardian SunGuard glass.
Matthew Marani


EMA PETER


EMA PETER


COURTESY SPEARHEAD

Above: The interior of the pavilion is treated with narrow strips of birch plywood. A central oculus and glazing bays provide ample daylight.

Above right: The exterior is clad with thousands of aluminum composite panels treated with a custom red blend by the manufacturer.

Right: Spearhead played an instrumental role in the project, joining at the design-assist phase to guide structural and material decisions.

WoodWorks™
WOOD PRODUCTS COUNCIL

Designing a wood building? Ask us anything.

FREE PROJECT SUPPORT • EDUCATION • RESOURCES

Carbon12
Path Architecture, Munzing Structural Engineering

photos Andrew Pogue

Nationwide support for the code-compliant design, engineering and construction of commercial and multi-family wood buildings

- Allowable heights and areas/construction types
- Structural detailing of wood-frame and hybrid material systems
- Fire resistance and acoustical-rated assemblies
- Efficient and code-compliant lateral system design
- Alternate means of code compliance
- Energy-efficient detailing
- Application of advanced building systems and technologies

woodworks.org/project-assistance • help@woodworks.org

MULTI-FAMILY/MIXED-USE • EDUCATION • OFFICE • RETAIL • INDUSTRIAL • CIVIC • INSTITUTIONAL

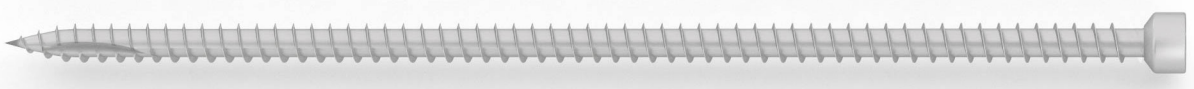
Ties and Fasteners

Tightly secure wood framing with the latest fasteners and ties. These connecting solutions for mass timber meet code requirements and are easy to install. By Gabrielle Golenda

CTX
Big Timber Construction Fasteners

Finished in a long-lasting bronze coating, this structural grade connecting screw is meant for exterior use. CTX is available in 1-inch to 16-inch lengths.

bigtimberfasteners.com



VGZ EVO FRAME
Rothoblaas

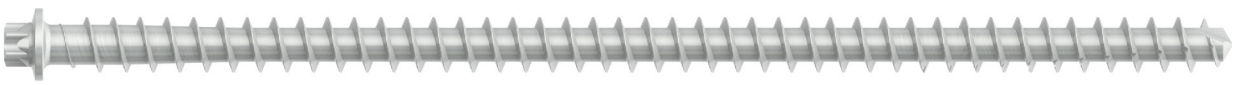
This fully threaded screw is perfect for connecting small wood structural elements like light frame uprights and crossbeams. The petite cylindrical head installs flush in the timber frame-work for a concealed appearance.

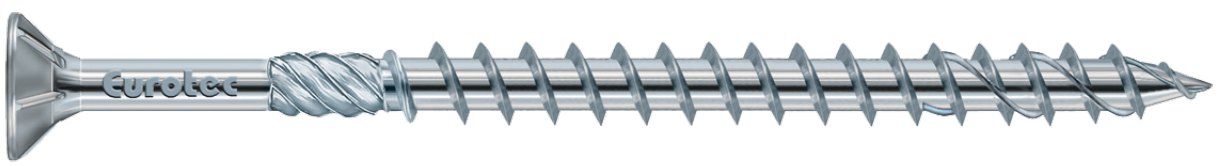
rothoblaas.com

ASSY VG Reverse Head screw
MyTiCon Timber Connectors

Designed for timber reinforcement, ASSY VG Reverse Head screws are some of the longest fully threaded screws on the market, available in lengths from 31½ inches to 59 inches. At 9/16-inch, the screw's very small diameter is nearly invisible after installation.

myticon.com





Paneltwistec DAG flange button head screw
Eurotec

These screws feature milled ribs above the thread and a sharp screw tip to reduce torque that causes splitting. The special hardened carbon steel coating resists corrosion and contains no chromium oxide, which is typical for other electrogalvanized products.

eurotec.team

TimberLOK Structural Wood Screw
FastenMaster

Ideal for heavy applications, TimberLOK is a screw for code-compliant truss and rafter connections. With a sharp point and sturdy threads, it is offered in lengths from 2½ inches to 10 inches.

fastenmaster.com

ALL IMAGES COURTESY OF RESPECTIVE MANUFACTURERS UNLESS OTHERWISE NOTED

Katerra CLT is your solution for best-in-class materials or full design-build services.

Cross-laminated timber is the future of sustainable building—Katerra makes it easy to get there. Learn how the expertise, capacity, and reliability of Katerra CLT can accelerate your next mass timber building project.

Inquire about your next project at katerra.com/CLT.

KATERRA

Haus Gables


NAARO


NAARO

Architectural designer: Jennifer Bonner / MALL
Location: Atlanta

Structural engineers: AKT II, Bensonwood, Fire Tower, and PEC Structural
CLT manufacturer: KLH Massivholz
CLT installation specialist: Terry Ducatt
Wood products specialist: 7 Seas Group USA
General contractor: Principle Builders Group
Associate architect: Olinger Architects
Mechanical systems: Emily McGlohn
Landscape designer: Carley Rickles
Interior designer: Jennifer Bonner / MALL

Facade research: Alex Timmer
Wall assembly: VaproShield VaproMat, Kooltherm K20 insulation

Haus Gables is a cross-laminated timber (CLT) home that was designed and developed by Jennifer Bonner in Atlanta's Old Fourth Ward neighborhood, along the BeltLine trail. The formally distinctive 2,200-square-foot home is one of only a handful of residences in the country made of CLT.

The design uses the DNA of traditional domestic roofs as a starting point, with exaggerated pitches and combined gables that generate a range of effects for dividing space. Six gables cluster and intersect to form unique profiles on all four elevations where the gables are abruptly cut, and the roof's ridges and valleys create unusual rooms, catwalks, and double-height spaces in the interior. "The underbelly of the gable roofs creates an airy, lofty space filled with ample natural light in what is actually a small building footprint," said Bonner.

The roof and all exterior and interior walls and floors are made of solid CLT panels that were cut and assembled in fourteen days. Each is up to 9½ inches thick and 34 feet long. The 87 panels are left exposed on the interior walls and ceilings, creating a monolithic appearance that contrasts with pops of eclectic colors and patterns on floors and wall coverings that riff off the tradition of faux finishes in the American South. On the exterior, two sides of the house are covered in faux bricks with a stucco dash finish with glass beads that produce a glittering effect. The unconventional approach is meant to suggest new directions for domestic architecture. **Eric Baldwin**


NAARO


NAARO

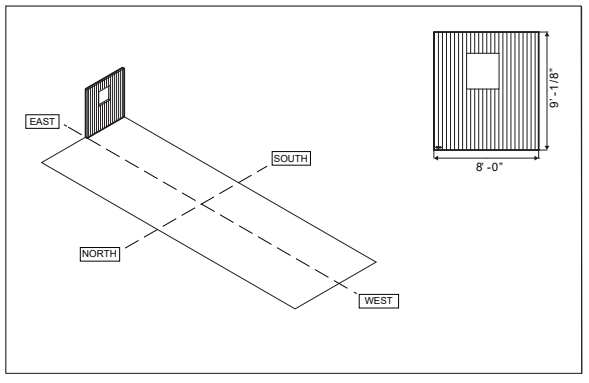
Above left: The bedroom's walls are covered by two different woods, one that continues from the ceiling and the other from the floor.

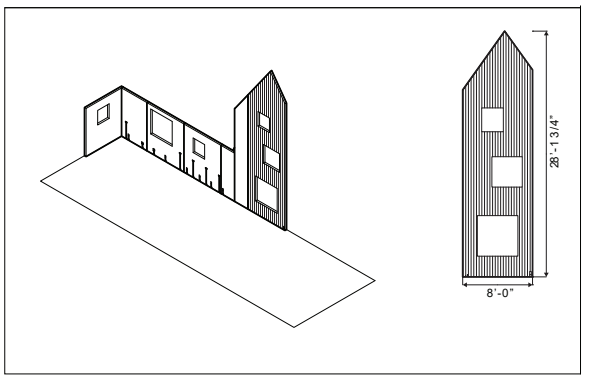
Above right: Floor materials and colors climb up the walls throughout the house.

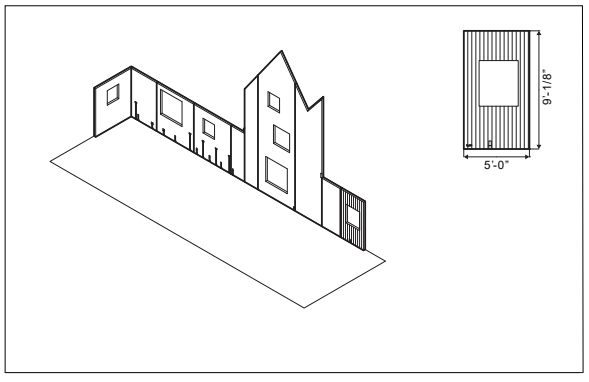
Far left: Part of the facade features faux bricks with a stucco dash finish and glittering glass beads.

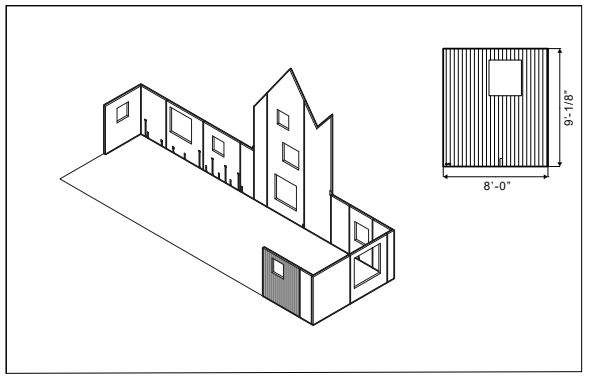
Near left: The multiple roof gables determined much of the layout beneath.

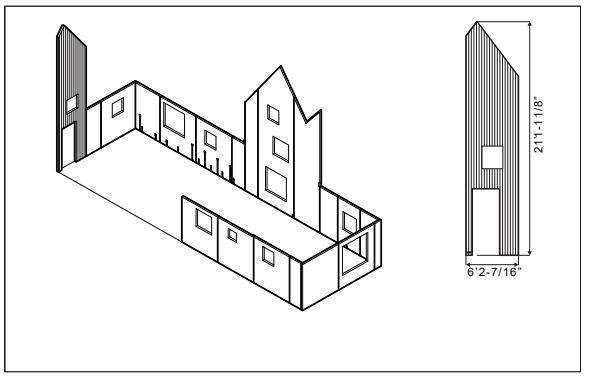
Facing page: Large, solid CLT panels make up the roof and all exterior and interior walls and floors.

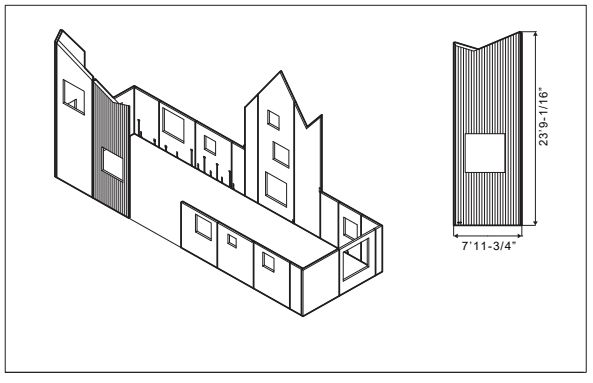

EAST
SOUTH
NORTH
WEST
9'-1/8"
8'-0"

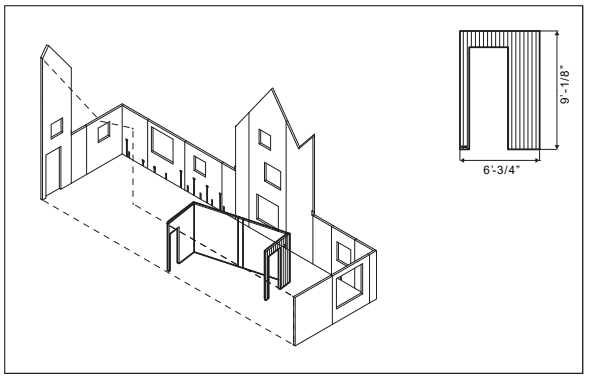

28'-1 3/4"
8'-0"

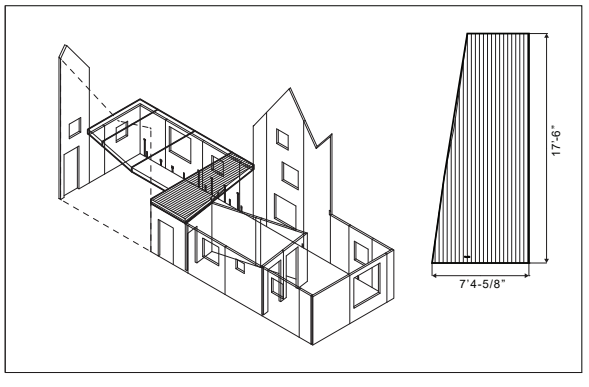

9'-1/8"
5'-0"

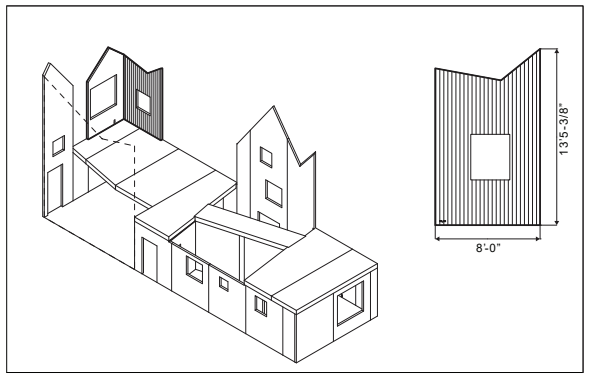

9'-1/8"
8'-0"

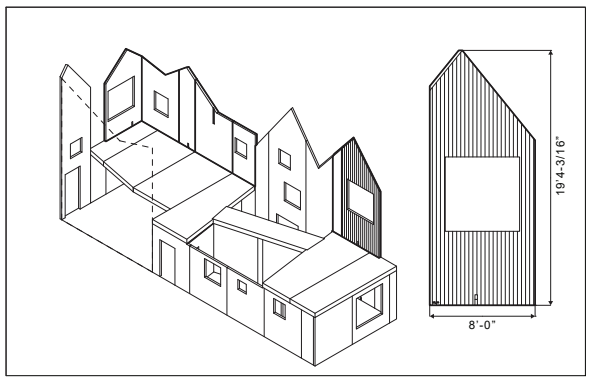

211-11/8"
6'2-7/16"

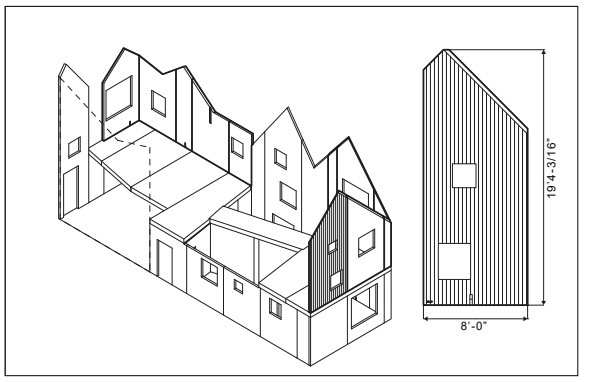

23'9-1/16"
7'11-3/4"

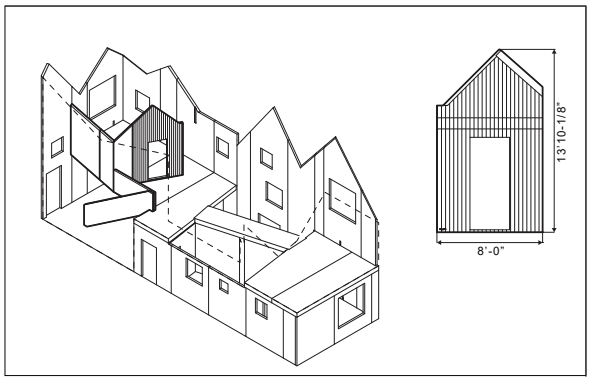

9'-1/8"
6'-3/4"

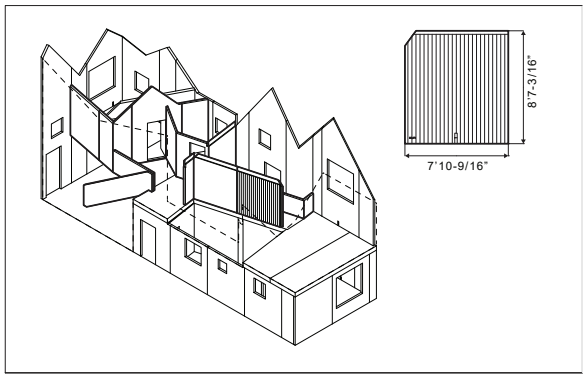

17'-6"
7'4-5/8"

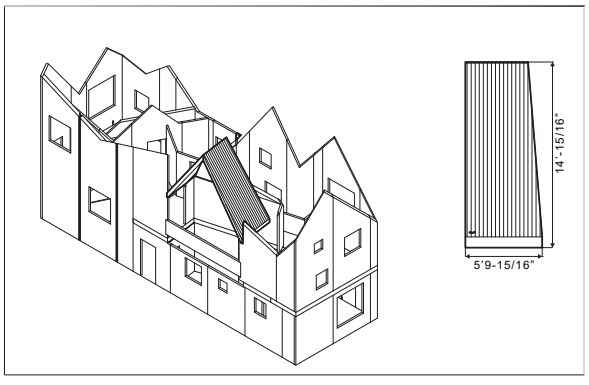

13'5-3/8"
8'-0"

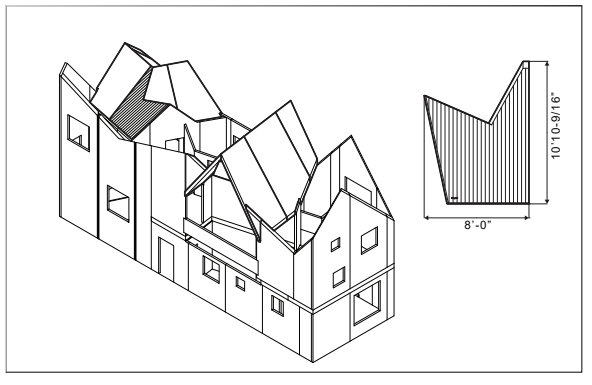

19'4-3/16"
8'-0"

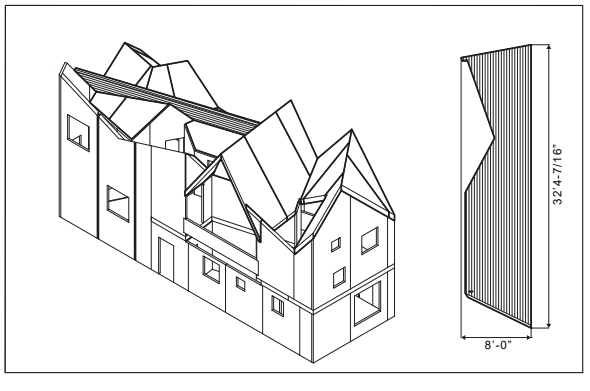

19'4-3/16"
8'-0"

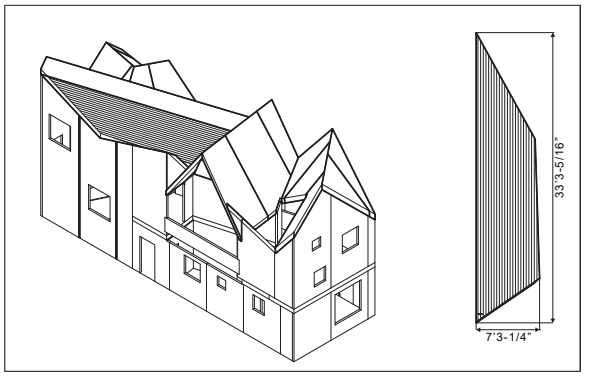

13'10-1/8"
8'-0"

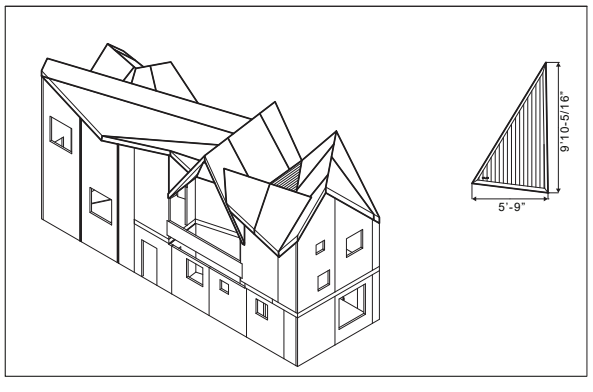

8'7-3/16"
7'10-9/16"


14'-15/16"
5'9-15/16"

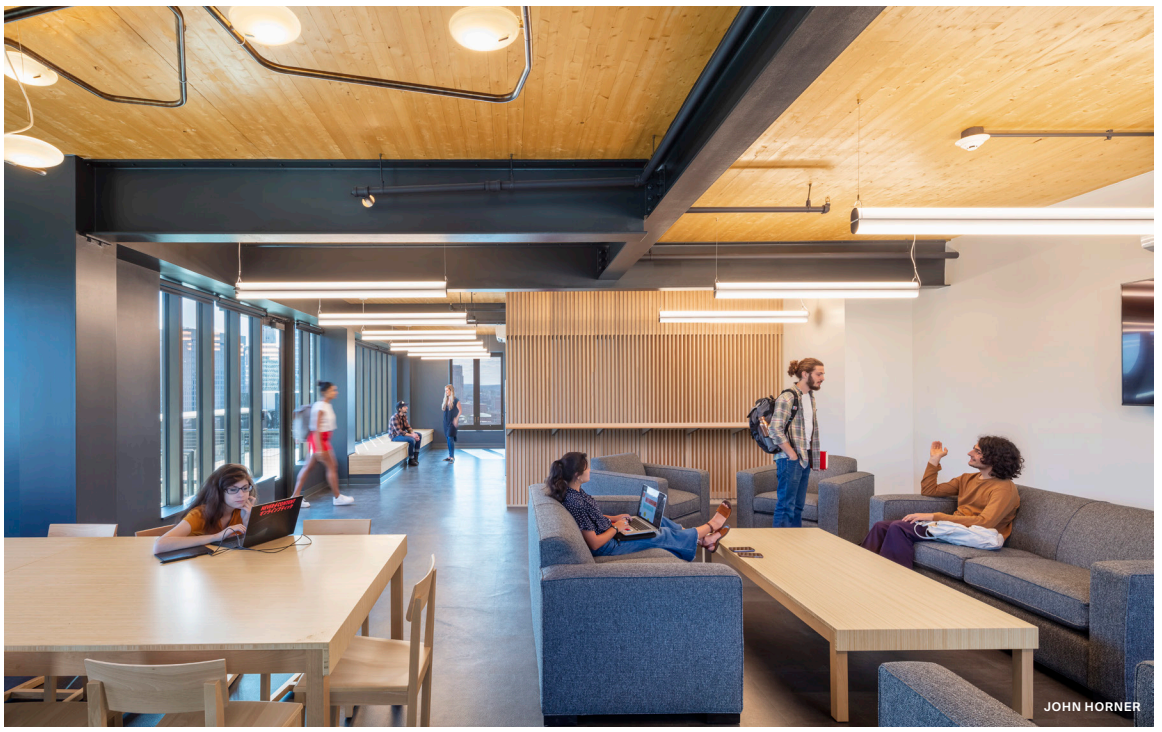

10'10-9/16"
8'-0"


32'4-7/16"
8'-0"


33'3-5/16"
7'3-1/4"


9'10-5/16"
5'-9"

Rhode Island School of Design North Hall


JOHN HORNER


JOHN HORNER


JOHN HORNER

Architecture: NADAAA
Location: Providence, Rhode Island

Structural engineer: Odeh Engineers
Civil engineer: Vanasse Hangen Brustlin (VHB)
Mechanical engineer: Environmental Systems, Inc.
Electrical engineer: Reilly Electrical Contractors (RELCO)
Plumbing: Arden Engineering Constructors
Construction manager: Shawmut Design and Construction
CLT fabricator: Nordic Structures
Steel and CLT erection: HB Welding
Steel: Ocean Steel
Exterior facade: Chandler Architectural Products
Masonry: Grande Masonry
Landscape: Landworks Studio
Shingle panels: Cembrit Patina
Field bricks: Cloud Ceramics Ebony Ironspot
Accent bricks: Endicott Clay Products Manganese Ironspot
ACM panels: Medium and Dark Bronze anodized Pac-Clad
Curtain wall: Kawneer 1600 SS and Clearwall
Windows: Wausau 3250i-XLT with heavy screen
Exterior plaster: Sto Color

The first residence hall built at Rhode Island School of Design (RISD) in 34 years, North Hall by NADAAA was designed to address contemporary concerns about environmental impact and energy use. The six-story, 40,100-square-foot dormitory houses 148 students while using a quarter less energy than a conventional building and almost half the amount of water as residential structures of a similar size. The building's structure is a cross-laminated timber (CLT) and steel-frame hybrid, the first of its kind for a residence hall in New England.

Mass timber slabs serve as wood decks, replacing more energy-intensive concrete, which reduced construction carbon dioxide emissions by up to 20 percent. Nordic Structures manufactured the 8-foot-wide by 50-foot-long panels to span the entire width of the building. The 5-ply grade E1 CLT floor panels are supported by steel wide flange beams at the exterior of the building and a line of framing down either side of its central corridor. Using Integrated Project Delivery, NADAAA worked with Shawmut Design and Construction and subcontractors to coordinate a central utility spine. The design exposes the structure of the ceilings in the dorm rooms, common areas, and corridors, avoiding dropped ceilings and significantly reducing the building's embodied energy.

The structure's high-performance envelope includes a brick and fiber cement panel rainscreen skin. The textured brick is a nod to the neighboring Quad buildings, designed in consultation with modernist architect Pietro Belluschi; embedded passageways connect the existing buildings to the new dormitory. The residence hall is equipped with amenities for art students, including studio and work spaces, galleries, and a spray booth.
Eric Baldwin

JOHN HORNER

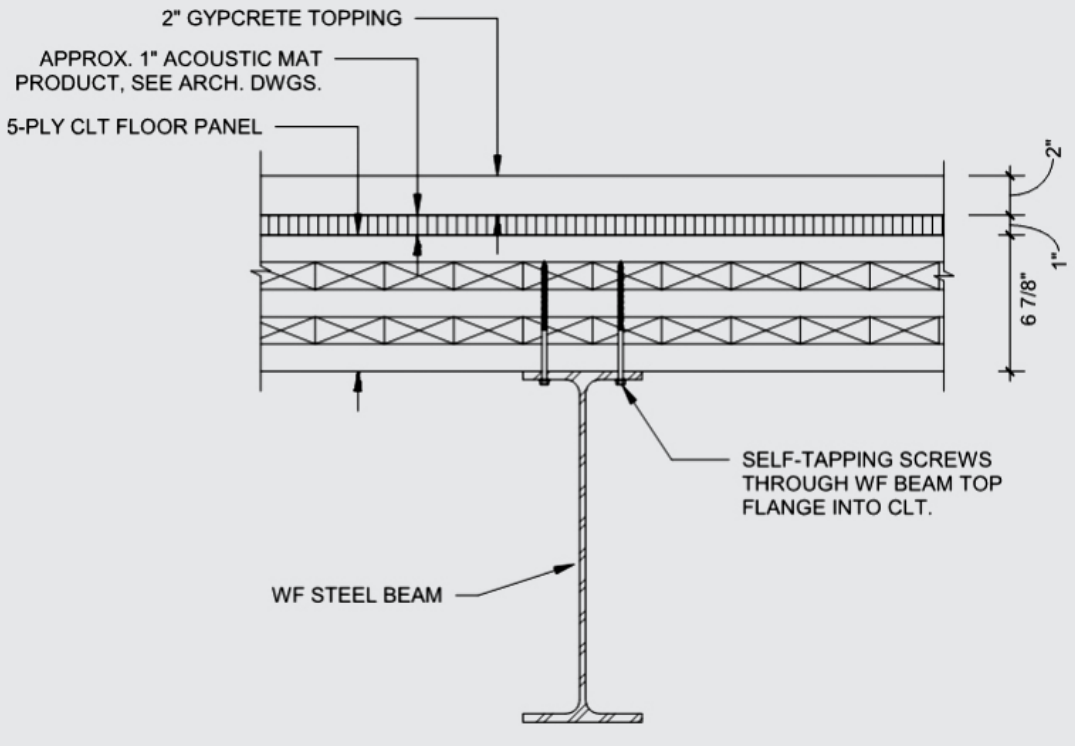
Facing page, top left: Exposed timber panels add warmth to the lounge's subdued design.

Facing page, top right: Fiber cement panels clad part of the building's facade.

Facing page, bottom: The gallery space continues the building's timber theme, using wood for seating and surfaces.

Above: The facade (background) also includes textured brick as a nod to surrounding Pietro Belluschi–designed **buildings.**

Right: As shown in this beam-to-floor detail, much of the building's structure is exposed.



COURTESY NADAAA

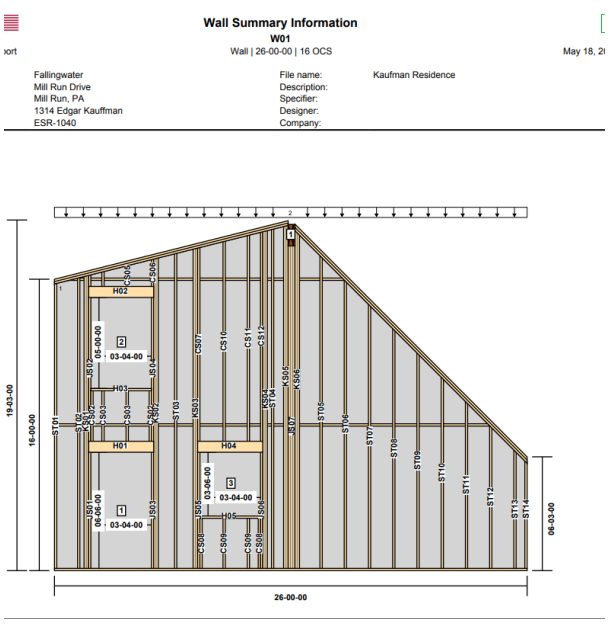
Timber Construction Software

These programs integrate seamlessly with BIM, Autodesk, and Rhino for easy collaboration between designers and manufacturers. For architects, specifiers, and structural engineers, the latest timber software aids in visualization, design, and construction of projects with wood products. By Gabrielle Golenda

BC Calc
Boise Cascade

This web-based application calculates the sizes of beams, joists, columns, studs, and tall walls. The program determines the appropriate Boise Cascade wood products for the designed application with a comprehensive engineering report that includes span and load information.

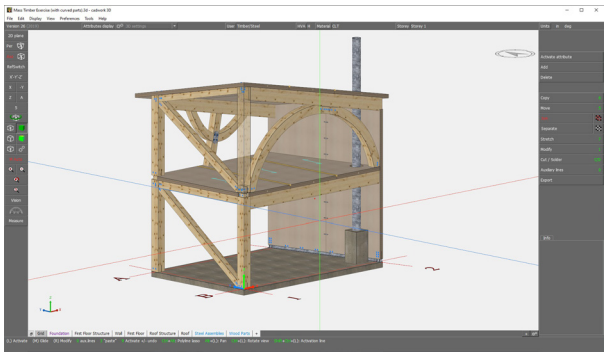
bccalc.com



cadwork wood
cadwork

Cadwork wood is a CAD/CAM software for wood construction, framing, and carpentry for every stage of a project from concept design to construction management. The program inserts structural designs directly into BIM models, exports data directly to production drawings, and ensures code compliance.

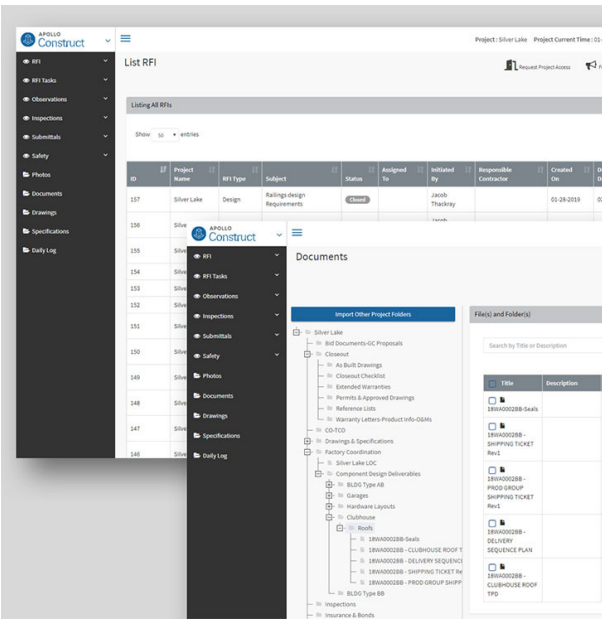
cadwork.com



Apollo
Katerra

Apollo offers three platforms to plan, design, and produce a project. Insight optimizes economic planning, site viability, and planning coordination; Connect streamlines design coordination and preconstruction; and Construct facilitates construction management and resourcing. Katerra is now offering prelaunch beta testing, and Apollo be widely available in late 2020.

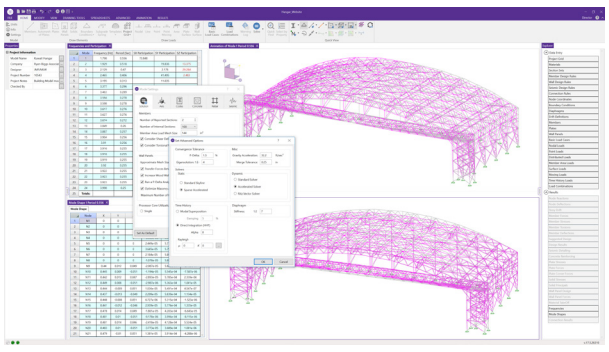
apollo.katerra.com



RISA-3D
RISA Tech

This platform allows designers to use advanced tools to model complex structures or input data directly from spreadsheets to create a design. The program provides insightful reports of engineering analyses, precise measurements, code checks, and more.

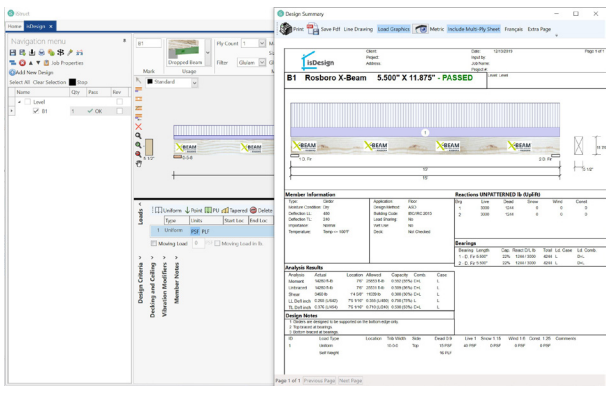
risa.com



isDesign
Rosboro

Rosboro's software specifies glulam and the correct product application in a given project. Using the company's diverse product library, the platform calculates loads for spans, cantilevers, and points and suggests products in compliance with United States building codes.

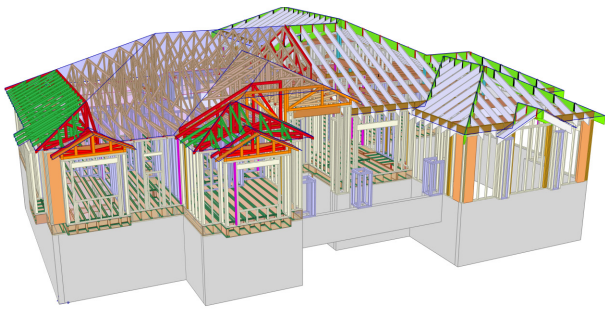
rosboro.com



Javelin
Weyerhaeuser

Javelin allows designers and engineers to model complete structural frameworks with Weyerhaeuser's wooden products. Features include sourcing products for specific applications, list procurement for on-site delivery, and tracking vertical loads.

weyerhaeuser.com



ALL IMAGES COURTESY OF RESPECTIVE MANUFACTURERS UNLESS OTHERWISE NOTED

Mass Timber

The latest mass timber products have strength, stability, and design flexibility. These cross-laminated timber (CLT), glued-laminated timber (GLT), and structural composite lumber (SCL) products can realize building heights and spans that would have previously required steel, masonry, or concrete structural support. By Gabrielle Golenda

Brisco Fine Line Panels
Brisco Manufacturing Ltd.

Ideal for floor, ceiling, wall, or roof applications, these laminated veneer lumber (LVL) panels are designed with layers of thin scarf jointed veneers. They are offered in sizes up to 11½ inches thick, 48 inches wide, and up to 60 feet long.

briscoman.com

KLH Cross-Laminated Timber
KLH Massivholz

These spruce CLT panels come in two types (transverse and longitudinal) and have three structural applications: for walls (transverse panel); and for slabs and roofs (longitudinal panel). Both panel types are made with double layers to increase rigidity and can be up to 55 feet long, 10 feet wide, and 1½ feet thick.

klh.at

Nordic X-Lam
Nordic Structures

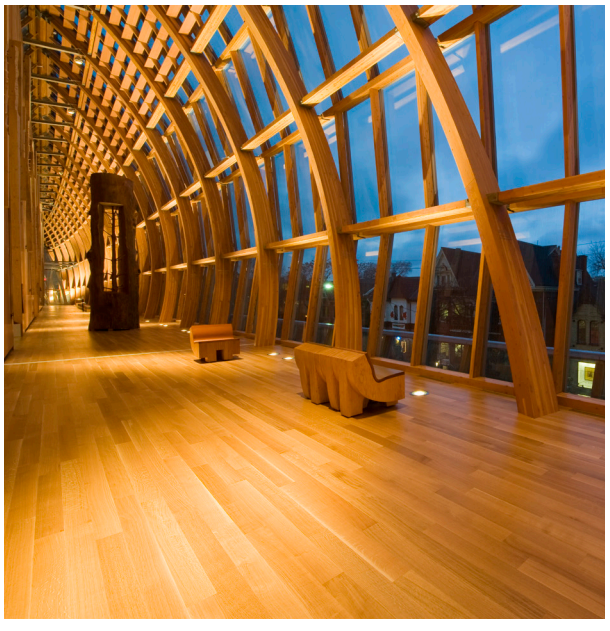
Nordic Structures CLT is fashioned from three orthogonal layers of lumber laminated with glue and structural adhesives. It can be used in wall panels, floor slabs, roof slabs, and light framing.

nordic.ca

Glulam Plus
Structurlam Mass Timber Corporation

This glued-laminated product is made with Douglas fir wood with small knots and tight growth rings. Glulam Plus can be engineered in an array of shapes and sizes for various structural applications.

structurlam.com



Westlam Beams
Western Archrib

Pairing a unique combination of western spruce and lodgepole pine, Westlam Beams are made from structural glued-laminated timber in imperial and metric sizes. Potential applications include floor beams, roof beams, headers, purlins, and trusses.

westernarchrib.com

SmartLam Cross-Laminated Timber
SmartLam

Appropriate for floor, roof, and wall applications, SmartLam's cross-lamination technology allows for two-way span applications. The units are made with spruce-pine-fir and hem-fir lumber in 12 inch to 120 inch widths, 4⅛ inch to 12⅜ inch thicknesses, and up to 40 foot lengths.

smartlam.com

ALL IMAGES COURTESY OF RESPECTIVE MANUFACTURERS UNLESS OTHERWISE NOTED

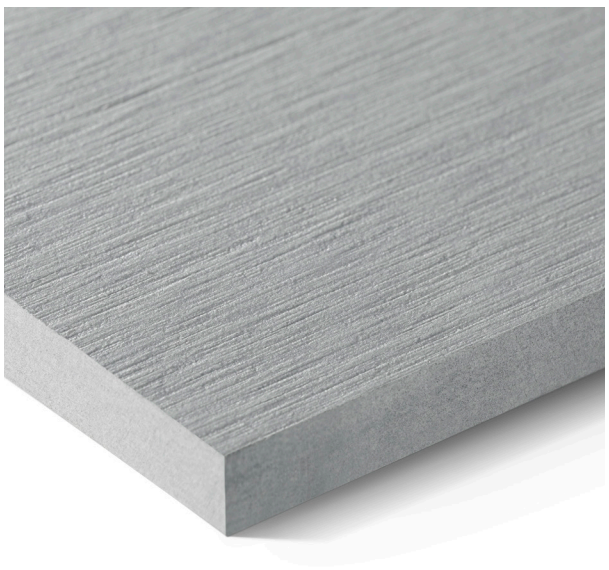
Noncombustible Cladding

For buildings with timber structures, a noncombustible skin can be used to reduce the rate of fire spread. By Gabrielle Golenda

Swisspearl Largo Vintago
Swisspearl

Made of mineral fiber cement, these noncombustible panels can be installed as flashing or lapped siding. Vintago is offered in large format sizes and with a sanded surface available in ten colors.

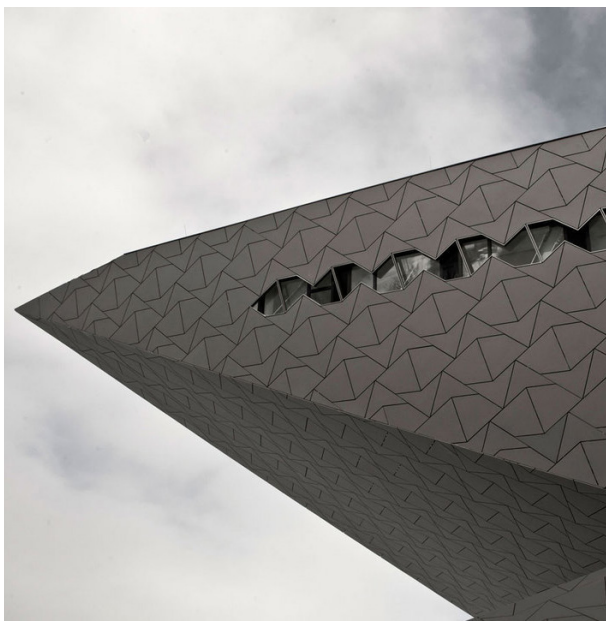
swisspearl.com



EQUITONE fiber cement panels
EQUITONE

EQUITONE fiber cement panels are sound absorbent, fire-safe, and water- and wind-resistant. They are available in five smooth or textured finishes.

equitone.com



concrete skin
Rieder

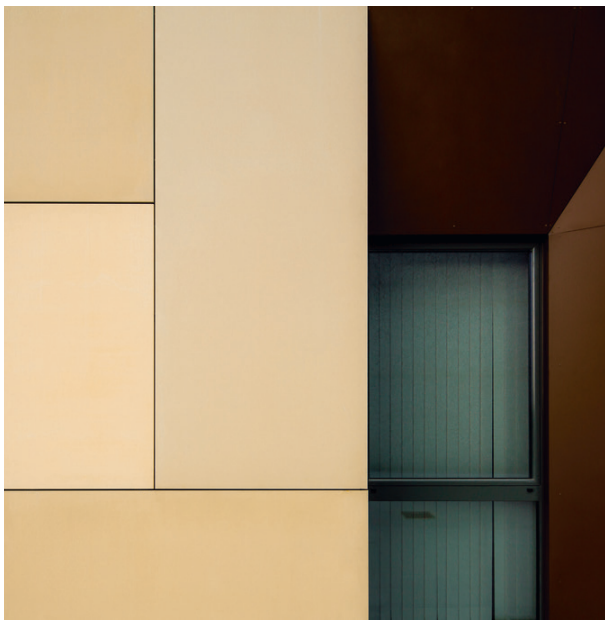
Fashioned from glass-fiber-reinforced concrete, these facade panels are strong and lightweight. The mineral-based material is inherently nonflammable and is offered in a variety of textures.

rieder.cc

Ductal
Ductal

This lightweight cladding system is self-supporting, insulating, and watertight. In addition to offering standard size panels, Ductal also custom makes precast facades from the same fiber cement materials.

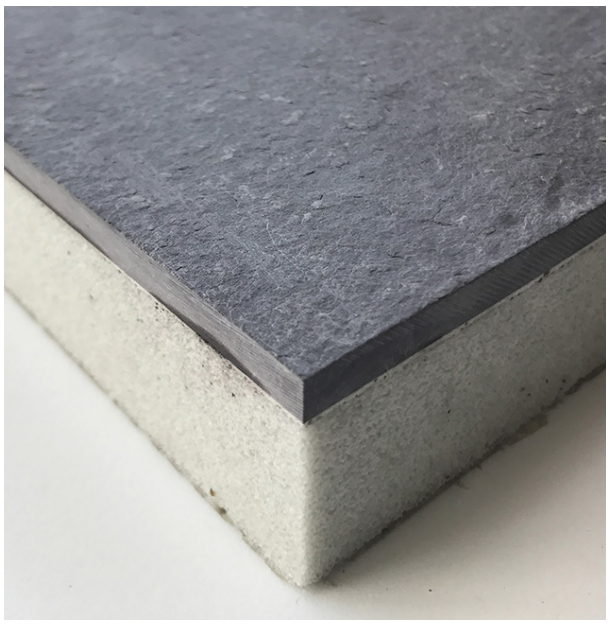
ductal.com



STONESCREEN Aerolite
STONESCREEN

Made from lightweight reinforced foam glass, these stone composite panels are ideal for high-rise construction. STONESCREEN Aerolite is stable, will not corrode, and will be unaffected by extreme temperatures, frost, or water.

stonescreen.org

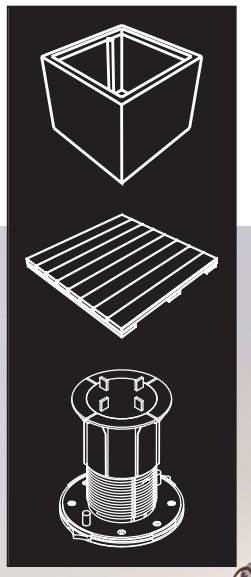


Allura Fiber Cement
Allura

Made for residential and light commercial applications, Allura Fiber Cement siding is resistant to UV rays, salt spray, and freeze-thaw cycles. The series is available in three textures, a wide array of colors, and 4-foot-by-8-foot, 4-foot-by-9-foot, and 4-foot-by-10-foot sizes.

allurausa.com

ALL IMAGES COURTESY OF RESPECTIVE MANUFACTURERS UNLESS OTHERWISE NOTED



21c Museum Hotel | Oklahoma City OK
architects: Deborah Berke Partners & Hornbeek Blatt Architects
original architect: Albert Kahn
photographer: Mike Schwartz

Rooftops redefined.

BISON
Innovative Products

bisonip.com | 800.333.4234
denver | colorado

Resources

Non-Combustible Cladding

Ductal
ductal.com

EQUITONE
equitone.com

James Hardie
jameshardie.com

Rieder
Rieder.cc

STONESCREEN
stonescreen.org

Swisspearl
swisspearl.com

Ties and Fasteners

Big Timber Construction Fasteners
bigtimberfasteners.com

Eurotec
eurotec.team

FastenMaster
fastenmaster.com

MyTiCon Timber Connectors
myticon.com

Simpson Strong-Tie
strongtie.com

Rothoblaas
rothoblaas.com

Mass Timber

Bison Innovative Products
bisonip.com

Brisco Wood Preservers
briscowood.com

D.R. Johnson Wood Innovations
oregonclt.com

Euclid Timber Frames
euclidtf.com

Freres Lumber Co.
frereslumber.com

International Beams
ibewp.com

Katerra
katerra.com

Kebony
kebony.com

LignaTerra
lignaterra.com

Nordic Structures
nordic.ca

Pacific Woodtech
pacificwoodtech.com

SmartLam
smartlam.com

Sterling
sterlingsolutions.com

StructureCraft
structurecraft.com

Structurlam
structurlam.com

Think Wood
thinkwood.com

Tolko
tolko.com

Vaagen Brothers Lumber
vaagenbros.com

Western Structures
westernstructures.com

West Fraser
westfraser.com

WoodWorks
woodworks.org

Timber Construction Software

Boise Cascade
bc.com

cadwork
cadwork.com

Katerra APOLLO
apollo.katerra.com

RISA Tech
risa.com

Rosboro
rosboro.com

Weyerhaeuser
weyerhaeuser.com


NAARO


NAARO

45 Highlights

West

HIDA I A Woodwork Tradition in the Making

Japan House Los Angeles
6801 Hollywood Boulevard
Los Angeles

Through April 12

COURTESY JAPAN HOUSE LOS ANGELES

Forest, human, time, craft. These four core principles have been upheld by the Japanese furniture manufacturer Hida Sangyo for a century, and are finding new life as part of *HIDA I A Woodwork Tradition in the Making* at Japan House Los Angeles. The exhibition proudly brings woodcraft from Japan's Hida region to Los Angeles, giving visitors the opportunity to discover the legacy of the region's woodworking through the output of the furniture maker. Displays highlight regional techniques such as *Ichii itto bori* (yew wood carving) and *mageki* (wood bending), as well as collaborations between Hida Sangyo and renowned designers like Sori Yanagi.

Founded in 1920, Hida Sangyo is one of Japan's oldest continuously operating furniture producers. The exhibition looks at how the company blends tradition and innovation by showcasing the sustainable use of cedar and the process of compressing and strengthening the wood in the company's modern facilities. A series of events and workshops accompany the exhibition throughout its run, rounding out Japan House's presentation of this craft heritage. **Shawn Simmons**

East

Nivola in New York I Figure in Field

The Irwin S. Chanin School of Architecture of The Cooper Union
Arthur A. Houghton Jr. Gallery, 2nd Floor
7 East Seventh Street
New York

Through March 15


NORMAN OBERFERST/COURTESY OF THE NIVOLA FAMILY ARCHIVE

Twentieth-century Italian sculptor Costantino Nivola left his mark across New York City's public realm. At least 17 of his sand-cast plaster and concrete sculptures, murals, and bas-reliefs can still be found in the city's public schools, plazas, and fire stations. *Nivola in New York I Figure in Field*, an exhibition at the Arthur A. Houghton Jr. Gallery at The Cooper Union, cocurated by Steven Hillyer, director of The Irwin S. Chanin School of Architecture Archive, and Roger Broome, a Brooklyn-based architect and Cooper Union alumnus, showcases four of Nivola's New York artworks made between 1953 and 1984. As an artist who collaborated extensively with architects—including Eero Saarinen and Marcel Breuer—throughout his career, and whose own practice traversed the disciplines of art and architecture, Nivola exemplifies art's role in shaping public space and civic life. **Emma Natanzon**

Midwest

Renegades: Bruce Goff and the American School of Architecture

Fred Jones Jr. Museum of Art
University of Oklahoma
555 Elm Avenue
Norman, Oklahoma

Through April 5


COURTESY OKLAHOMA HISTORICAL SOCIETY

Few educators have had as profound an impact on a university's pedagogical trajectory as Bruce Goff at the University of Oklahoma (OU) from 1947 to 1955. The self-trained architect and mentee of Frank Lloyd Wright elevated the school's design department into a program globally recognized for an approach that avoided architectural clichés and became known as the "American School" of architecture. Now on view at the Fred Jones Jr. Museum of Art, *Renegades* situates Goff's commitment to empowering individual creativity within the story of architectural education in America.

Curated by historian Luca Guido, the showcase is a collaboration between the museum and OU's Christopher C. Gibbs School of Architecture. The exhibition team culled over 150 rarely seen drawings, models, and texts by OU students and faculty during Goff's tenure as department chairman. Three sections walk visitors through the history of Beaux Arts and Bauhaus education styles, the curriculum and work of the American School, and the experimental works by the "renegade" architects from OU who carried Goff's legacy around the world. **Sydney Franklin**

East

Public Works: Reflecting on 15 Years of Project Excellence for New York City

Center for Architecture
536 LaGuardia Place
New York

Through April 4


NAHO KUBOTA

Whether they realize it or not, New Yorkers interact with the work of the city's Department of Design and Construction (DDC) every day. The department has overseen the construction of the museums, libraries, and pedestrian plazas that compose the New York City landscape. The Center for Architecture is now showcasing the recent history of the DDC, which has made building innovative and ambitious projects a central tenet of its work since it implemented the Design and Construction Excellence program in 2004. With the help of architects and designers, the DDC has spearheaded some of New York's most exciting projects in recent years, including the pedestrianized Times Square plaza and the recently opened Hunters Point Library. On view through April 4, *Public Works: Reflecting on 15 Years of Project Excellence for New York City* looks at some of these projects and how the department created them. **EN**

Living on Campus: An Architectural History of the American Dormitory

By Carla Yanni | University of Minnesota Press | $34.95

Dormitories figure prominently in the popular vision of American college life. They might have different forms, such as buildings surrounding a quadrangle inspired by medieval European universities or functional, modernist structures with an interior array of nearly identical rooms lining both sides of a long hallway. Dorms establish college as more than just a place where a person gains skills and knowledge before going out into the world, getting a job, and getting on with life; they help make higher education a distinctive life experience. Academic leaders have long fostered this concept. Lucy Diggs Slowe, the dean of women at Howard University in the 1920s and '30s, declared dormitories to be not only "laboratories in human relations," but also places "for the development of those cultural pursuits that ought to be part of every college student's life." In *Living on Campus: An Architectural History of the American Dormitory*, Carla Yanni, an architectural historian at Rutgers University, examines residence halls not as "mute containers for the temporary storage of youthful bodies and emergent minds." Rather, in tracing 300 years of this building type, Yanni sees dormitories as evidence of educational ideals, ways to manage new types of students, and broader societal shifts.

The first residence hall was a space of exclusion. Constructed in the 1650s, the Indian College at Harvard University was intended to house 20 indigenous students so they could live near their classes while remaining separated from white students. This building, Yanni argues, demonstrates that "from the very beginning of colleges in North America, student housing existed to establish hierarchies." The indigenous population differed from the typical college student of the period, namely a white teenage boy from an elite family. College contributed to these students' individual formation, but was also a broader reflection of a flourishing America. Nassau Hall, completed in 1756 at the College of New Jersey, now Princeton University, was "the largest and most distinguished structure in the colony." The dorm was separated from the street by a spacious lawn and surrounded by farms, which, university leaders argued, provided the isolation from the adjoining settlement and distance from home that gave students the best chance of becoming useful citizens.

Once women began attending college in large numbers in the 19th century, their living quarters functioned as both a sanctuary and a means of surveillance and management. Completed in 1887 at Oberlin College, Baldwin Cottage, designed by Weary and Kramer, offered a homelike environment with a combination of public and private spaces, including a parlor, reception hall, and dining room along with bedrooms. Women living in the dorms were subject to strict rules about walking in the halls and requisite bedtimes, but since male students at Oberlin lacked similar accommodations until 1910, social life at the college revolved around women's residence halls.

The 1944 GI Bill resulted in a near-doubling of the number of college students in the decade after 1945. Faced with this expanding population, urban universities, such as Rutgers University and New York University, constructed high-rise dormitories that were not only economical, but required less land than a leafy, low-rise quadrangle. High-rise dormitories also appeared outside of urban areas, such as the Morrill and Lincoln Towers at Ohio State University, designed by Schooley, Cornelius, and Schooley and completed in 1965, with room for more than 3,800 students. Intended as a response to criticisms about the impersonal appearance of high-rises, the towers' rooms were arranged in a distinctive honeycomb-shaped plan meant to encourage better communication and raise student morale. Kresge College, by MLTW, which opened in 1973 at the University of California, Santa Cruz, offered a more striking critique of high-rise dormitories as well as the seeming impersonality of a large university: Its low, white buildings were accented with playful red, blue, and yellow supergraphics and housed a mere 270 students. Kresge's distinctive design was intended to signal the school's close-knit student and faculty community and experimental curriculum.

Does the image of college life change without the dormitory? Today a considerable number of students attend college beyond their teenage years and early twenties, at community colleges or commuter schools, or exclusively online. Yanni's conclusion points to these issues regarding the future of dormitories, but the book as a whole raises questions about the relationship between architecture and transformations of the American university. Whether in the shape of a medieval quadrangle, Georgian estate, or high-rise tower, residence halls help maintain the conventional image of an American undergraduate. But shifts in the student body and new resources and buildings to facilitate education will inevitably prompt new stories about higher education in the United States.

Pollyanna Rhee is an architectural and landscape historian at the University of Illinois at Urbana-Champaign.

Top: Baldwin Cottage at Oberlin College, designed by Weary and Kramer.
Middle: Calhoun College (now Grace Hopper College) at Yale University, designed by John Russell Pope.
Above left: Julius Silver Residence Hall at New York University's former uptown campus, designed by Marcel Breuer and Associates.
Above right: Morrill and Lincoln Towers at Ohio State University, designed by Schooley, Cornelius, and Schooley.

Structured Lineages: Learning from Japanese Structural Design

Edited by Guy Nordenson | Museum of Modern Art | $45.00

COURTESY TOYO ITO & ASSOCIATES

KENTA MABUCHU VIA WIKIMEDIA COMMONS

COURTESY KAWAGUCHI & ENGINEERS

Top: Meiso no Mori (Forest of Meditation) designed by Toyo Ito and engineered by Sasaki Mutsurō.
Above left: Interior view of the Izumo Dome in Shimane, Japan, designed by Kajima Design and engineered by Saitō Masao.
Above right: Expo '70 Fuji Group Pavilion in Osaka, Japan, completed in 1970 and designed by architect and engineer Kawaguchi Mamoru.

Learning from Japanese **continued from front page** with these architects. (Nordenson himself has a significant engineering practice, and worked with SANAA on the New Museum in New York and Johnston Marklee on the Menil Drawing Institute in Houston.) The resultant publication, *Structured Lineages: Learning from Japanese Structural Design*, illuminates key figures of postwar Japanese structural engineering and the hybrid nature of their consulting on the major works in the MoMA show. *Consulting* is not the right word for the essential, creative contributions of these talented engineers. As Nordenson noted in his introduction, "In Japan the cultures of architecture and engineering are entirely intertwined." Laurent Ney observed that the architect and engineer Saito Masao titled an exhibition that he organized at the Architectural Institute of Japan in Tokyo in 2008 *Archi-neering Design*, coining a term that neatly grafts the two disciplines. Aspiring Japanese architects and engineers study together at university in the first phase of their education and specialize only later on. Design and technical skill are given equal weight academically, which forges a hybrid of both disciplines from a unified way of thinking.

The *Structured Lineages* symposium highlighted various practitioners of this fusion of art and technology: In addition to Masao, Yoshikatsu Tsuboi, Mamoru Kawaguchi, Gengo Matsui, Toshihiko Kimura, and the most significant contemporary structural engineer, Mutsuro Sasaki (who has collaborated with architects like Kenzo Tange and Rem Koolhaas), were given their rightful prominence by experts such as Marc Mimram of l'Ecole d'Architecture de Marne-la-Vallée, Mike Schlaich of Technische Universität Berlin, Jane Wernick of Jane Wernick Associates, and William F. Baker of SOM. Three roundtable discussions, moderated by Sigrid Adriaenssens, John Ochsendorf, and Caitlin Mueller and transcribed in the book, explored the basis for this "intertwining" of disciplines. These revelations—of what would be considered in Japan to be open secrets—feel like the discovery of why there is such qualitative consistency in Japanese design and architecture.

Numerous structures are presented throughout the book. Little known architect/engineer Mamoru Kawaguchi's Fuji Pavilion at Expo '70 in Osaka, the book's cover image, could easily be mistaken for an early Ant Farm proposal (or a late Zaha Hadid project), with its colorful inflated tubular skin and curvaceous geometry. Toyo Ito's innovative Sendai Mediatheque, with its occupiable structural elements engineered by none other than Sasaki, makes an appearance. MoMA curator Sean Anderson details how, in 1954, a traditional Japanese house came to be the third constructed "House in the Museum Garden," following designs by Marcel Breuer and Gregory Ain.

This newly published book of the symposium offers essential enlightenment into the thinking, philosophy, and technical explorations behind these canonical buildings. It adds insightful analysis of and commentary on the special circumstances that gave rise to these projects, even though these significant Japanese structural engineers may be unfamiliar to the average American architecture student (and quite possibly for the average American architect). The documentation of the technical contributions, coupled with the high regard in which these projects are held internationally, makes *Structured Lineages* a necessary companion text for those with a deeper curiosity about the basis for the uniqueness of the design and structural experiments that have come to define architecture in contemporary Japan.

Craig Konyk is an architect and the chair of the School of Public Architecture at the Michael Graves College at Kean University in New Jersey.

facades+

THE PREMIER CONFERENCE ON
HIGH-PERFORMANCE BUILDING ENCLOSURES

14 CITIES IN 2020

San Francisco (AM)
JANUARY 31

Washington DC (AM)
FEBRUARY 20

South Florida (AM)
MARCH 13

Portland (AM)
MARCH 20

New York City
APRIL 2+3

Charlotte (AM)
APRIL 28

Boston (1-DAY)
JUNE 10

Kansas City (AM)
JULY 8

Chicago (AM)
SEPTEMBER 11

Denver (1-DAY)
OCTOBER 1

Los Angeles
OCTOBER 29+30

Houston (AM)
NOVEMBER 10

Toronto (1-DAY)
NOVEMBER 19

Seattle (1-DAY)
DECEMBER TBD

facadesplus.com

@facadesplus #facadesplus

A'20

Get ready for the architecture & design event of the year!

Registration opens
January 22, 2020

AIA Conference on Architecture 2020
May 14–16, Los Angeles

conferenceonarchitecture.com

50 Marketplace

ARCHITECTURAL DIGEST

AD DESIGN SHOW

March 19-22, 2020
Pier 94 NYC

Buy tickets now **addesignshow.com**

PRODUCED BY:

VORNADO
REALTY TRUST

54 Emerging Voices

The Architectural League of New York's annual Emerging Voices program once again delivers eight up-and-coming practices making an impact on building and discourse. This year's jury was composed of Stella Betts, Mario Gooden, Mimi Hoang, Lisa Iwamoto, Dominic Leong, Paul Lewis, Matt Shaw, and Lisa Switkin.

Escobedo Soliz

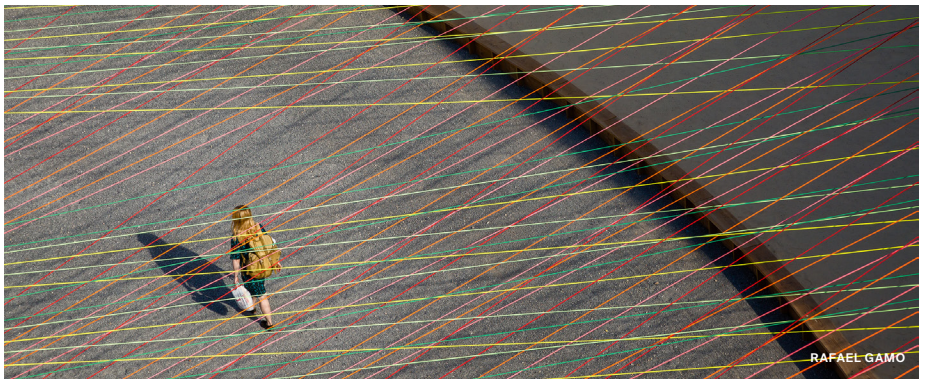
Only four years after founding their firm, Pavel Escobedo and Andres Soliz have built a trusted brand in Mexico City's saturated design market. Escobedo Soliz formed soon after the pair graduated from the National Autonomous University of Mexico and together won the 2016 MoMA PS1 Young Architects Program (YAP) summer installation competition.

Their YAP project, *Weaving the Courtyard*, brought acclaim in the U.S. but not at home, Soliz said. "That award is amazing for people in New York and holds a lot of prestige among those people, but here in Mexico, sadly, developers don't care as much. What we took from that experience was a foundation of concepts and rules that we have used to build our practice, like the value of using simple or prefabricated materials and constructing by hand."

After struggling to get commissions back in Mexico, the duo moved to Bolivia for a year to begin work on an ongoing design-build structure: a 17,200-square-foot funeral chapel made of artisanal brick on a shoestring budget. This project helped define the studio's emerging focus on social service. When the pair returned to Mexico, their first major project was the José Maria Morelos Primary Rural School in Santa Isabel Cholula, part of the recovery from the deadly 2017 Puebla earthquake, which damaged over 200 public school buildings in the state. The design team conceptualized and built the school in just nine months.

"In Mexico, the country's laws are very strict and the architect frequently has to be the builder," said Soliz. "That's why we go after custom projects in different contexts and with low budgets, whether it's for someone's home or a special typology like the funerary chapel. We like to focus on the quality of materials and controlling the details. As young architects in Mexico, this keeps us competitive."

Sydney Franklin


RAFAEL GAMO


ARTURO ARRIETA

Top: *Weaving the Courtyard* at MoMA PS1 featured wood and colored rope as primary materials. The firm often takes reusable products and uses them for both temporary or permanent shelter—for example, the ropes shown here were donated to a group of Brooklyn weavers.

Above: Escobedo Soliz also tackles competitions and installation work, where the firm experiements with form. With *Torax*, a 2019 gallery installation, Soliz said they were inspired by the rib cage of a whale.

Young Projects

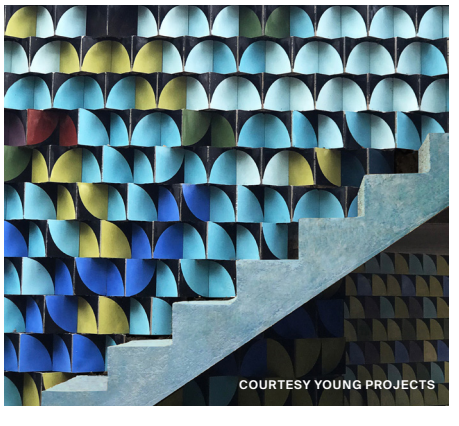
Bryan Young, principal and founder of Brooklyn-based Young Projects, aims for ambiguity. His buildings lend themselves to spatial and material misreadings that disrupt conventional hierarchies, inviting occupants to recalibrate their relationships with their surroundings.

"A tension exists between a normative reading and a misreading, but the misreading is just subtly off," Young said. "It's always something that is just a little bit off that draws you into the work."

Young founded his firm in 2010 after working for Allied Works, Architecture Research Office (ARO), and Peter Pfau, all previous Emerging Voices winners that explore and exploit material properties. Since then, Young has designed polished residential projects that reinterpret familiar materials or layouts. Several walls of the Pulled Plaster Loft in Tribeca ripple with a custom pulled-plaster treatment that adapts techniques used to make traditional crown molding; the plan of the forthcoming 6 Square House in Bridgehampton, New York, is simultaneously a cluster of squares, a crossing of bars, and a fragment of an extendable pattern; and the Glitch House in the Dominican Republic is clad in encaustic cement tiles arranged to confuse light and shadow. Smaller, in-house experiments (Young refers to them as "young projects") incubate ideas and processes that could be applied to larger work, or just inspire new ways of creating. Currently sitting in his office is a tensile structure encrusted with salt crystals that might—or might not—point toward what Young Projects has in store.

Jack Balderrama Morley


COURTESY YOUNG PROJECTS


COURTESY YOUNG PROJECTS

Above: The parti of the 6 Square House can be read in a variety of ways, an example of the productive ambiguity Young Projects pursues in its work.

Left: The encaustic cement tiles of the Glitch House are patterned to confuse light, shadow, and depth.

55 Emerging Voices

Mork Ulnes

Dividing his time between Oslo, Norway, and San Francisco, Casper Mork-Ulnes has learned to synthesize design principles from the two regions as the basis for Mork Ulnes, the firm he founded in 2005. “Simply put,” he explained, his eight-person team is “influenced by Scandinavian practicality and California’s spirit of innovation.”

Residential design makes up the majority of the firm’s completed work, including the dramatic renovation of several Victorian-era homes throughout San Francisco. When updating antiquated interiors, Mork Ulnes “strives to make [homes] more efficient, more light-filled, and less compartmentalized,” according to the architect, “to perhaps hark back to a California way of living in which buildings were once more extroverted.”

When given the opportunity to design from the ground up, the firm favors locally sourced woods and distinctly minimal forms. For example, the exterior of Mylla Hytte, a 940-square-foot cabin set within a Norwegian forest, is clad in untreated heart-pine planks that will weather over time, in contrast to the plywood of its interior walls and built-in furniture. **Shane Reiner-Roth**


BRUCE DAMONTE


BRUCE DAMONTE

Top: The pinwheel floor plan and restrained material palette of Mylla Hytte was generated by the rugged conditions of its forested hill site just outside of Oslo, Norway.

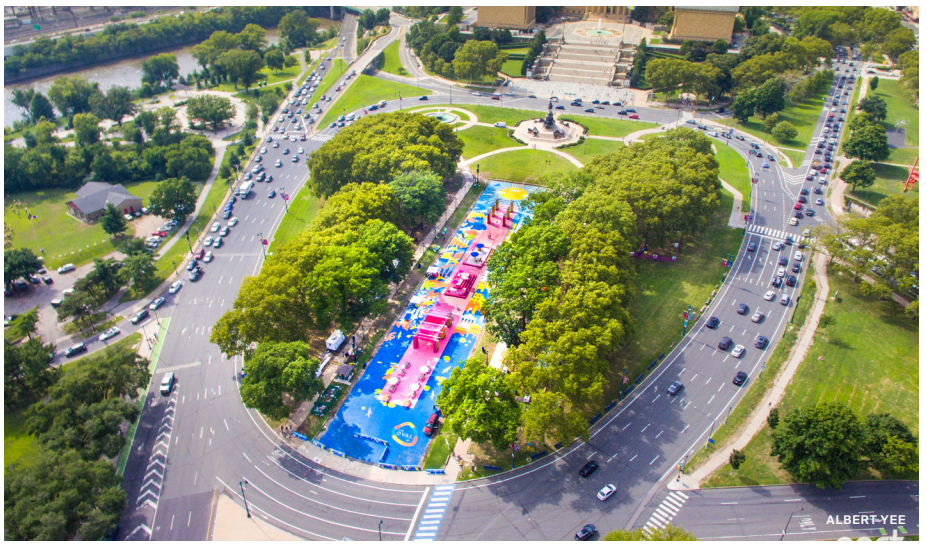
Above: The primary goal of the 15th St house, the renovation of a 1906 Victorian home in San Francisco, was to bring light into the building’s formerly dark and cavernous interior.

PORT

The members of Chicago and Philadelphia–based firm PORT have made it their mission to elevate urban navigation from a chore to a pleasure. The firm believes that a city’s highways, byways, and interstitial spaces reflect a collective attitude toward equity, democracy, and civil rights, and that those values can be bolstered by creative design intervention.

Christopher Marcinkoski and Andrew Moddrell both trained as architects and formally established PORT in 2013 after setting their sights on the spaces in between buildings. They demonstrated their passion for the interstitial with their Lakeview Low-Line project, a collection of bright yellow urban furniture installed beneath the elevated train tracks of Chicago’s Brown Line. “Lakeview takes a site that no one pays attention to,” said Marcinkoski, “and demonstrates the possibility of transforming that space into something that is generous and welcoming.” PORT has also taken to increasing public engagement at sites that have long been the center of civic attention, as in its OVAL+ series of temporary pavilions for Eakins Oval, the 8-acre park in front of the Philadelphia Museum of Art. **SRR**


COURTESY PORT


ALBERT YEE

COURTESY LANDSCAPE FORMS

Top: The Big Shift, PORT’s design for a multi-acre park along Chicago’s lakefront, proposes big changes to the city’s urban infrastructure to make room for public amenities.

Middle: For the 2018 Summer at Eakins Oval program held in the plaza in front of the Philadelphia Museum of Art, the firm developed Oval+, a series of vibrantly colored interactive pavilions around the theme “More Park, More Play.”

Above: Lakeview-Low Line, a series of furniture pieces beneath a portion of Chicago’s elevated train tracks, provides unprogrammed community amenities in a space that had long been underused.

56 Emerging Voices

Peterson Rich Office

Sculptural gallery interiors, high-end retail, and housing and maintenance strategies for the New York City Housing Authority (NYCHA)—three areas that might seem incongruous, but at the nine-year-old Peterson Rich Office (PRO), designing airy, light-filled spaces is part and parcel of considerate urban planning.

Founders Miriam Peterson and Nathan Rich trace their approach to experiences working at Tod Williams Billie Tsien Architects and Steven Holl Architects—two firms known for their bright institutional projects—as well as SHoP, which Rich says taught him to break down the profession's "traditional barriers and open [himself] up to different types of work." Because of often tight budget constraints, PRO's projects focus on form, gesture, and filling spaces with natural light instead of expensive materials.

The studio is working with New York's Regional Plan Association to come up with suggestions for how NYCHA can simultaneously make up its $31.8 billion maintenance deficit while capitalizing on the agency's 68.5 million square feet of undeveloped floor area. This isn't the firm's first dance with NYCHA; in 2014, PRO's 9x18 project provided a blueprint for turning the housing agency's 20 million square feet of parking into infill housing, and those strategies made their way into Mayor Bill de Blasio's affordable housing plan.

"We always start with a certain amount of research, and try to draw from that research a series of goals for the project," Rich said. "We try to introduce what we call 'five points'; these are values and goals built with the client, guiding principles, and those things emerge from context, institution, and need. It's narrative, and we try to stay true to those things."
Jonathan Hilburg

Dake Wells

"People are often surprised by how our projects end up looking like they do in these really rural areas," said Andrew Wells, cofounder of Kansas City–based firm Dake Wells. "The common question we get is, How did you do that? For us, it boils down to solving peoples' problems. There is an aesthetic component to that, yes, but it's just a response."

On numerous occasions Wells and Brandon Dake, who together started the studio in 2004, have presented several design options to a client who ended up choosing the most challenging proposal on the table. Take Reeds Spring Middle School in rural southwestern Missouri. Set on 150 acres of undeveloped land beneath the Ozark Mountains, this 2017 project is tucked into a sloping ravine. "Finding the right spot to put the school was hard, so one of our ideas was to allow the building to negotiate the steep topography of the site," said Wells, "but we didn't think they'd go for it." In the end, the semisubterranean design allowed Dake Wells to add a storm shelter to protect students, teachers, and staff during tornado season, one of the client's biggest goals, and resulted in a striking exterior.

According to the design team, using few materials and a muted color palette also helps them concentrate on forming shapes that will stand out. Both Dake and Wells are from small towns in Missouri and feel most rooted in their work when they return to similar spots throughout the region on commission, often collaborating with low-income school districts with tight budgets. "We don't subscribe to the notion that good design is for elite clients with money to spend," Dake said. "We take on low-budget projects and push them as far as we can." **SF**


COURTESY PETERSON RICH OFFICE


COURTESY PETERSON RICH OFFICE

Top: PRO's ground-up, mixed-use Metropolitan Avenue tower in Brooklyn puts a new twist on classic load-bearing masonry walls with its soft, rounded corners. This rendering shows deeply set windows, which ensure a level of passive solar shading.

Above: The firm's Roof by Roof proposal envisions building on top of the city's existing public housing towers. This would fix the pervasive need for roof repairs, slot in more livable area, and help make up NYCHA's enormous budget shortfall.


GAYLE BABCOCK, ARCHITECTURAL IMAGEWORKS


GAYLE BABCOCK, ARCHITECTURAL IMAGEWORKS

Top: "We often ask ourselves what can we do with just five or six materials," said Dake. "We try to show a fair amount of restraint in that way." For the new 13,000-square-foot welcome center at Mississipi State University, Dake Wells designed a trapezoidal plan that highlighted large swaths of glass, metal, and brick.

Above: At Reeds Spring Middle School, the firm integrated a cascading concrete stair inside the large atrium, accented with a series of simple wooden slats. Light coming in through the glass ceiling panels enrich the materials' warm tones and textures.

57 Emerging Voices

Blouin Orzes

Few have mastered the nuanced art of designing for the extreme climate of Canada's Circumpolar North in the face of global warming. But Marc Blouin and Catherine Orzes of Montreal-based Blouin Orzes architectes have made that challenge the heart of their practice. Dedicated to what they describe as a "tireless journey" through the villages of Nunavik, the vast northern third of Quebec, Blouin and Orzes create buildings that empathetically address the pressing needs of Inuit communities.

For Blouin Orzes, the work doesn't stop at the building itself—the architects also play an active role in public consultation processes, sourcing funding and filing grants on behalf of their clients. "It's a constant search for a balance between tradition and modernity in the contemporary realities of northern communities," the architects explained. "We have discovered the importance of patiently learning from a culture distinct from our own and have come to love the landscapes and respect nature's harsh conditions."

The Katittavik Cultural Centre in Kuujjuarapik, a village on the coast of Hudson Bay, is representative of the firm's work providing much-needed social spaces for people in remote locations. Upward of 10,000 people use the center, located in one of Nunavit's 14 communities north of the 55th parallel. The area's harsh conditions create construction challenges, like high costs, a limited labor force, protracted schedules, and concerns about sustainability. Yet building here takes not only resources and time, but also considerable trust—which the designers work continually and respectfully to earn. **Leilah Stone**

JAMES BRITTAIN

COURTESY BLOUIN ORZES ARCHITECTES

JAMES BRITTAIN

Top: The Polar Bears International House in Churchill, Manitoba, completed in collaboration with Verne Reimer Architecture.

Middle: The Katittavik Multidisciplinary Hall in the Northern Village of Kuujjuarapik, Nunavik, Quebec.

Above: The MARS Arctic Research and Conservation Centre in Churchill, completed in collaboration with Verne Reimer Architecture.

Olalekan Jeyifous

For Olalekan Jeyifous, the physical world doesn't take precedence over the space of imagination. By embracing the tension between reality and invented narratives, his work produces a panoply of architectural inquiries in various media, including hyperreal photomontages, public sculpture, whimsical installations, and immersive VR experiences. Rather than prescribing function, his projects encourage their audiences to reconsider architecture's relationship to the communities it affects.

Jeyifous describes his work as a result of the "process of connection as opposed to reaction, evoking a notion of 'place' rooted in immanence and possibility." His built public work embraces multiplicity and interpretation, and engages each community's historic and contemporary challenges, including histories of mobility and displacement, issues of equity in urban housing markets, and the importance of public spaces as sites of protest.

His unbuilt work is equally rooted in social justice. Born in Nigeria, Jeyifous has developed various projects that envision the future of the country's sprawling megacity, Lagos, in a way that questions ideas of what progress looks like. In *Shanty Mega-structures*, he produced a series of renderings depicting the city's informal settlements at the scale of large commercial developments, asking viewers to reconsider who visionary architecture should be for and what practices should inspire it. **LS**

COURTESY EISTLIN HAISS

COURTESY BRYAN ESLER

Top: Aerial photo of *Durham In Continuum*, a banner wrap created in downtown Durham, North Carolina. Jeyifous said, "The design serves to illuminate history, change, and community through abstract, nonhierarchical snapshots of the past, the present, and future of this area of the city."

Above: *The Boom and the Bust*, a monumental sculpture in downtown Grand Rapids, Michigan, "acknowledges the historic and contemporary challenges of housing discrimination and the inequities of urban life," said Jeyifous.

California must work quickly to adopt mass timber

LEVER Architecture's Thomas Robinson discusses the impact California could have on the timber industry when it adopts the new IBC changes.

COURTESY LEVER ARCHITECTS

843 N Spring Street in Los Angeles by LEVER, shown in a rendering here, has a hybrid structural system that combines a CLT floor system with exposed steel columns and beams.

We are witnessing a revolution in how we build with engineered timber in the United States.

In January 2019, the International Code Council (ICC) approved changes that would allow high-rise wood buildings in the 2021 International Building Code (IBC). Oregon and Washington were early adopters of these code changes, and Denver, Colorado, recently followed suit. Other states and municipalities are expected to adopt the 2021 IBC timber provisions early, but it is anyone's guess what California will do. Will the state decide to adopt now, or will it wait till the code becomes part of the new issuance of the 2021 IBC? This is an important question not just for California, and by extension the City of Los Angeles, but also for the future of mass timber in the U.S. and beyond. California standards and codes transform markets, and a mass timber movement in the U.S. without the state that is also the world's fifth-largest economy is not going to move the needle fast enough. The opportunity to scale a low-carbon, renewable supply chain to address catastrophic climate change is closing quickly, and it is time for California to step up and demonstrate the progressiveness and leadership that have been key to its prosperity.

What does early adoption mean in practice? Today, an architect in Oregon or Washington who follows the provisions of the new IBC can stamp drawings to build a timber building up to 270 feet in height as of right. This is a significant change. Just over four years ago, my firm's design for a wood high-rise called Framework was selected as one of two winners of the first U.S. Tall Wood Building Prize Competition. At that time, there was no code path in the U.S. for wood buildings over 75 feet. To receive a permit, our team of designers and engineers worked with the State of Oregon on a performance-based design process. Partly funded by the competition prize, this process included 40 tests on full-scale timber building assemblies to demonstrate their fire, seismic, structural, and acoustic performance relative to high-rise life-safety requirements. It was a fascinating, exhausting, and exhilarating experience, and we are proud that this work and research impacted the timber code changes. Thanks to the new code provisions, it is unlikely that another design team will ever have to go through this process in quite the same way again.

Early adoption of the timber code provisions isn't just about tall buildings, though—it is a critical opportunity to encourage wider investment and innovation in sustainable mass timber development of all scales. Why should California (or any place else) care about mass timber construction? Building with engineered timber products addresses our most pressing global challenges. It has the potential to decrease carbon emissions relative to construction, spur rural economic development, encourage forest practices that prevent fires, and increase the speed at which we can deliver projects, including much-needed affordable housing. The promise of a major market like California supporting mass timber construction will be an incentive for manufacturers to invest in a more advanced supply chain, back new research, and encourage more sustainable forest management. California's early advocacy of renewables and electric vehicles moved the market (see Tesla), and I believe it could have a similar impact on the development of mass timber.

We are currently in the permit process for one of the first multistory office buildings in Los Angeles with a cross-laminated timber (CLT) floor system. The building is essentially a hybrid, with CLT floors and steel columns and beams. It meets the current code and does not use the provisions of the 2021 IBC because the highest occupied floor is not over 75 feet. That said, it is still a 125,000-square-foot building—not a small undertaking. We have been working closely with Los Angeles authorities and our engineer to clarify and explain how the CLT performs structurally in the project and how it fits within the current code. We have made incremental steps that will allow for subsequent projects to better navigate permitting this type of building, as well as open up options for multiple CLT suppliers to serve the Los Angeles market. I believe these small steps are significant, but I know that my team could have gone further faster if California had already adopted the new timber provisions. Building officials in California are justifiably cautious. The optics of approving tall wood construction as the state faces devastating wildfires is difficult. However, moving in this direction creates a market that will advance the sustainable forest management that prevents these fires in the first place. If we are serious about addressing the major environmental issues of our time, we need California to adopt the 2021 IBC now. We are simply running out of time.

Of course, there is more to do. I believe as architects we must rethink design as a wider ecosystem of environmental and regional economic choices. Where our materials come from and how they are produced should drive and inspire our designs. This is not a limitation but an invitation to innovate with regional, renewable materials to create more compelling architecture that truly addresses both local and global issues.

Thomas Robinson is the founder and principal of LEVER Architecture.

See more images at archpaper.com.

TECH+

TRANSFORM THE BUILT ENVIRONMENT

THE FUTURE OF THE AEC INDUSTRY

Network, exchange ideas, and learn about advanced materials, apps, sensors, systems, and innovative products that help create the spaces of the future.

July 16, 2020
New York City

Sponsorships: Diana Darling
ddarling@archpaper.com | 212 966 0630

techplusexpo.com
@techplus #techplus

NEOLITH®
SINTERED STONE

Ventilated Facade: Neolith® ARCTIC WHITE | Flare of Frankfurt (Germany) | Designed by Hadi Teherani | Installed by Lithodecor

Neolith® is an architectural skin that offers the most efficient solutions for the most demanding of architectural projects.

Resistant to stains and changes in temperature, Neolith® is produced with 100% natural raw materials which guarantees it will remain unaltered over time.

The large format reduces waste and completion times.

Neolith® ventilated facades also provide continuous insulation and block direct solar radiation for considerable energy savings.

It also gives architects real design freedom due to the unlimited possibilities and capacity to resemble all-natural materials like stone, wood and metal while maintaining a perfect balance between aesthetics and functionality.

Discover more on **www.neolith.com** | @neolithnorthamerica

EVOLV SURFACES: SF (Northern CA), OR, WA, ID, NV, AK & HI; **GLOBAL GRANITE & MARBLE:** MO, KY & KS
HG STONES: NY, NJ; **LA NOVA TILE:** TX (Houston)

MARBLE & GRANITE: CT, MA, ME, RI & VT
MARVA MARBLE: VA, MD, NC, DC, WV, PA, DE, SC;
OLLIN STONE: Southern CA;

OMICRON GRANITE: FL, AL, LA, MS & OH
POMOGRANIT STONES: TX (Houston)
STONE CENTER: GA;

STONE DESIGN: IL, IN, IA, WI, MN & MI
THE STONE COLLECTION: TX (Dallas, Fort Worth), NM, NE, CO, AZ, UT & MT.