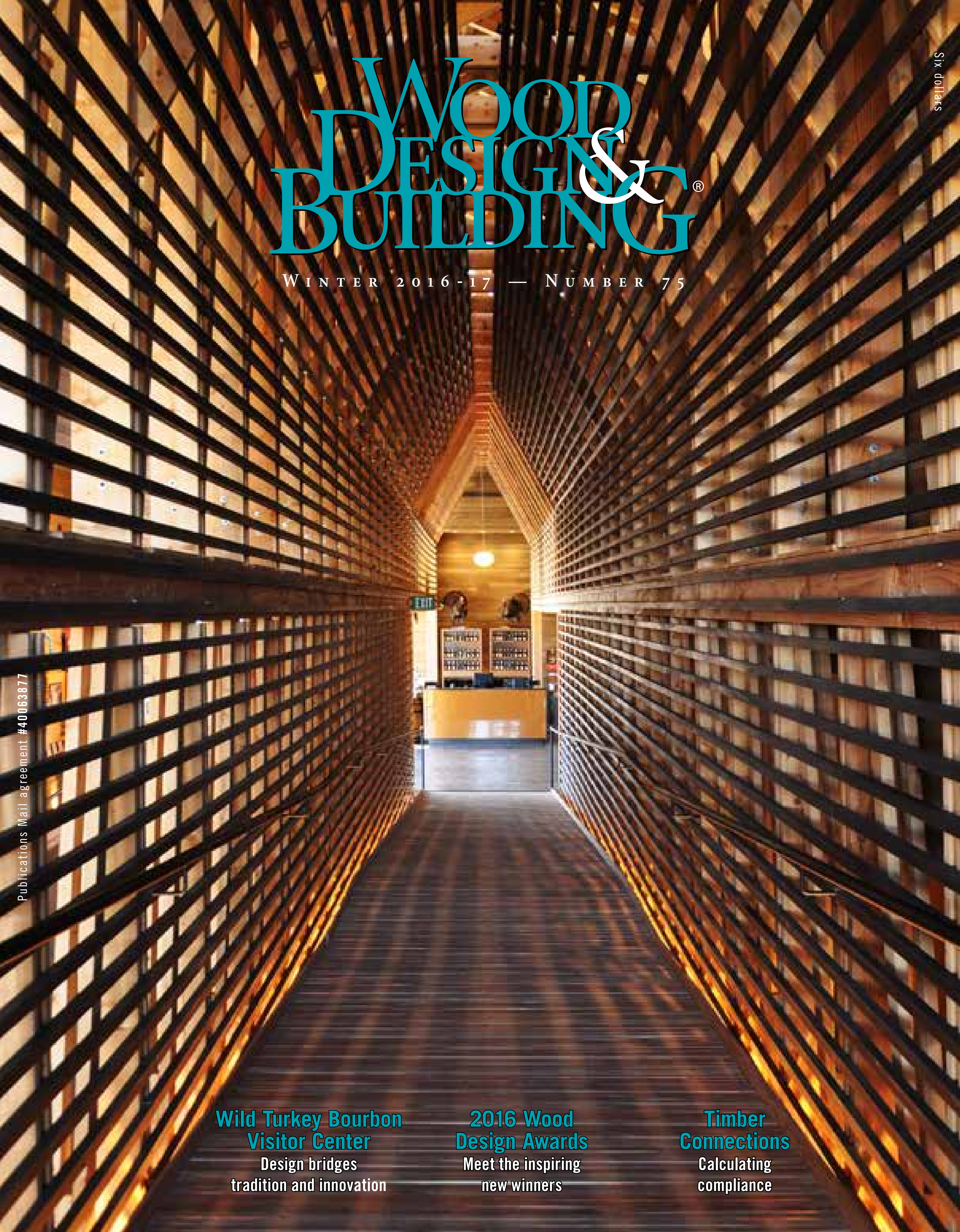


Wood Design & Building®

Winter 2016-17 — Number 75

Six dollars

Publications Mail agreement #40063877

Wild Turkey Bourbon Visitor Center
Design bridges tradition and innovation

2016 Wood Design Awards
Meet the inspiring new winners

Timber Connections
Calculating compliance

CANADA'S REPUTATION TAKES TOP SPOT

Looking up: Tall Wood Buildings Around the World

Holz8	Cenni di Cambiamento	Forté	Brock Commons	Treet Building	Bridport House
GERMANY	ITALY	AUSTRALIA	CANADA	NORWAY	ENGLAND

Tall wood building supplied by Structurlam.

Structurlam is a leader when it comes to redefining what is possible in tall wood structures. We strive to provide the most advanced and efficient mass timber solutions and are proud to be the preferred supplier for the 18 stories Brock Commons building. Canada is tall wood.

STRUCTURLAM
Intelligence In Wood

Structurlam.com

Wood Design & Building®

contents

Above and **on the cover:** WILD TURKEY BOURBON VISITOR CENTER, LAWRENCEBURG, KY
PHOTO CREDIT: Roberto de Leon (De Leon & Primmer Architecture Workshop)

On the Cover

Departments

Features

PHOTO CREDIT: Jane Hebert

Life Lessons

I was reminded of an important life lesson recently: the success of others teaches us valuable lessons about ourselves.

At the December judging of the *Wood Design & Building* Awards, I asked the judges for some overall thoughts on the 184 submissions they had reviewed.

"It's inspiring that people are getting the message about using wood and the number of innovative projects we looked at will push me forward, push us forward, push the profession forward," said Brian Court, Partner at The Miller Hull Partnership. Court added he saw a lot of opportunity for new ways of using wood, including taking wood buildings taller, and that the overarching goal to use less carbon-intensive materials is very positive.

Patricia Patkau, Principal, Patkau Architects, said, "What struck me was that the international grouping had a significant contingent of very impressive projects. A number of them made me think that I have to step it up, and I like projects that do that. The outstanding international projects tell me that culture matters. If you have a culture that supports innovation it will also support the exceptional. The international projects challenged me personally."

Our response in these situations teaches us valuable lessons about ourselves. A friend told me a story about his son's recent hockey game. He said that despite blocking dozens of shots, Ben, a goalie, had allowed seven goals and his team had lost. A mother had asked if Ben was alright. My friend responded that of course he was, it's part of the game, and that we celebrate the good and the bad. The mother left dumbfounded.

I like the positivity in these responses and the idea that another person's success can help propel us all forward. Overcoming difficulties is the key to innovation no matter who you are or what you do. Imagine where we'd be without it.

Theresa Rogers
Executive Editor
trogers@dvtail.com

Wood Design & Building magazine invites you to submit your project for consideration and possible publication. We welcome contributed projects, bylined articles and letters to the editor, as well as comments or suggestions for improving our magazine. Please send your submissions to Theresa Rogers at trogers@dvtail.com.

inspiration BOARD

WHAT I LEARNED THIS MONTH...
It's all about connections.

SPONSORED BY SANSIN

The role of connections in wood buildings

"We must value inventive and powerful applications of wood and its application in joinery. There's very little investigation into joinery and yet I think that's one of the keys to wood buildings."
– Peter Bohlin, Principal,
Bohlin Cywinski Jackson and
Wood Design & Building Awards judge

The value of connecting with people

Nothing can replace a face-to-face meeting or seminar. The Toronto Wood Solutions Fair packed great networking opportunities and dozens of educational seminars on timber engineering, CLT, and prefabrication, into one amazing day.
http://wood-works.ca/ontario/wsf/

The vulnerability of connections

Manufacturers of pressure treated wood have shifted production to products containing brown colorants in response to market demand. Specifiers must consider that the different preservatives, in the same use environment, may react differently to the metals of fasteners, connectors and coverings.

the BIG 95 Tabbies 2015 Award Winner

WOOD DESIGN & BUILDING
www.wooddesignandbuilding.com
Winter 2016-17, Volume 20, Issue 75

PUBLISHER ETIENNE LALONDE elalonde@cwc.ca
PUBLISHING MANAGER SARAH HICKS shicks@wood-works.ca
COMMUNICATION MANAGER NATALIE TARINI ntarini@cwc.ca
SPECIAL PROJECTS MANAGER IOANA LAZEA ilazea@cwc.ca

EXECUTIVE EDITOR THERESA ROGERS trogers@dvtail.com
STAFF WRITERS HERMIONE WILSON hwilson@dvtail.com
KELLY TOWNSEND ktownsend@dvtail.com
EDITORIAL INTERN MICHELLE CHIU
CONTRIBUTORS MAIK GEHLOFF, HENRY WALTHERT
ART DIRECTOR SHARON MACINTOSH smacintosh@dvtail.com

ADVERTISING SALES
SALES MANAGER BETH KUKKONEN bkukkonen@dvtail.com 905-886-6641 ext. 306
SENIOR ACCOUNT EXECUTIVE GILLIAN THOMAS gthomas@dvtail.com 905-886-6641 ext. 308
V.P. PRODUCTION SERVICES ROBERTA DICK robertad@dvtail.com
PRODUCTION MANAGER CRYSTAL HIMES chimes@dvtail.com

DOVETAIL COMMUNICATIONS PRESIDENT SUSAN A. BROWNE sbrowne@dvtail.com

CIRCULATION
PUBLICATION PARTNERS wdesign@publicationpartners.com

SUBSCRIPTIONS
Four issues per year for $24.00, two years for $40.00, and three years for $50.00.
Please call toll-free 1-866-559-WOOD or visit our Web site to subscribe.
Subscription inquiries and customer service:
1-866-559-WOOD or email wdesign@publicationpartners.com
Send address changes to:
PUBLICATION PARTNERS
Garth Atkinson
1025 Rouge Valley Dr., Pickering, ON Canada L1V 9Z9

Published by:
DOVETAIL COMMUNICATIONS INC.
30 East Beaver Creek Rd., Suite 202, Richmond Hill, ON Canada L4B 1J2
905-886-6640 Toll-free 1-888-232-2881 www.dvtail.com
For:
CANADIAN WOOD COUNCIL
99 Bank St., Suite 400, Ottawa, ON Canada K1P 6B9
1-800-463-5091 www.cwc.ca
www.WoodDesignandBuilding.com www.WoodDesignAwards.com
ISSN 1206-677X

Publication Mail Agreement #40063877
Printed on recycled paper Printed in Canada

Zoo Pavilions and Enclosures

Kelly Townsend

Wood is known for its sustainability and reliability as a building material, and often used when there is a desire to create a structure with close ties to nature. For this reason, it seems natural and appropriate that wood inspired the architecture of the following zoos and animal enclosures.

For the entrance pavilion to La Garenne Zoo in Switzerland, timber was selected as the main building material and 97 per cent of the materials were sourced locally. The wood elements blend with wildflower growth on the wide roof structure while angled wooden verticals complete the aesthetic.

At the Öhringen Petting Zoo in Germany, the decision to use wood was made out of consideration for the health of the animals. Designers used larch, which does not need to be treated; this addressed concerns about having toxic elements near the animals.

Both The Elephant House in Zurich Zoo and the Orangutan Boardwalk in Perth Zoo marry the practical and aesthetic advantages of wood to simulate a more natural environment and provide a sense of comfort for the animals living there. The mesmerizing wood roof of the Elephant House was specially designed to blend into the forest landscape surrounding the structure while the carefully designed nesting platforms were critical for the orangutans to feel at home.

These structures are excellent examples of how wood is able to create breathtaking and safe environments for zoo patrons while simultaneously benefiting the animals that live there.

1. **La Garenne Zoo Entrance Pavillion (2016)**
   Architect: LOCALARCHITECTURE
   Location: Le Vaud, VD, Switzerland
   PHOTO CREDIT: Matthieu Gafsou

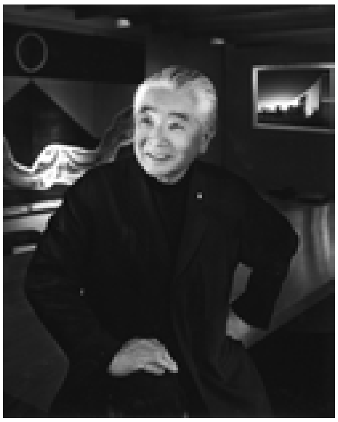
2. **Öhringen Petting Zoo (2015)**
   Architect: kresings architektur
   Location: Öhringen, Germany
   PHOTO CREDIT: Roman Mensing

3. **Elephant House (2014)**
   Architect: Markus Schietsch Architekten
   Location: Zurich, Switzerland
   PHOTO CREDIT: Andreas Buschmann

4. **Perth Zoo Orangutan Boardwalk (1999)**
   Architect: iredale pedersen hook architects
   Location: Perth, Australia
   PHOTO CREDIT: Peter Bennetts, Acorn, Shannon McGrath

Timber Structures to Open CLT Manufacturing Plant in Ontario

Timber Structures Inc. recently announced its plans for a full-scale heavy timber CLT manufacturing plant to open in Ontario in late 2017. The province is poised to take a leadership role in low-carbon innovative construction technologies throughout North America, says a press release. Timber Structures' ability to provide a full range of services from design, consulting and engineering to fabrication and erection, will mean that building with CLT and other engineered wood products can be done locally, more competitively than ever before. Using CLT in projects shifts the production effort from the building site to a factory where components are designed and manufactured under controlled conditions to exact specifications, then transported to site for rapid assembly. Local manufacturing will mean reduced shipping distances, shorter lead-times and faster turn-around time – resulting in lower construction costs and more LEED Qualification points. Most of the timber will be sourced from Ontario. **www.timberstructures.ca**



The Moriyama RAIC International Prize was established in 2014 by architect Raymond Moriyama along with the RAIC and the RAIC Foundation.

2017 Moriyama RAIC International Prize Accepting Submissions

The Royal Architectural Institute of Canada (RAIC) is accepting submissions for the 2017 Moriyama RAIC International Prize. The prize, which was established in 2014 by Canadian architect Raymond Moriyama along with the RAIC and the RAIC Foundation, consists of a monetary award of CAD $100,000 and a handcrafted sculpture designed by Wei Yew. The prize celebrates a single work of architecture that is judged to be transformative within its societal context and reflects Moriyama's conviction that great architecture transforms society by promoting social justice and humanistic values of respect and inclusiveness. The prize, awarded every two years, is open to all architects, irrespective of nationality and location. The winner is selected in an open, juried competition. In 2014, the inaugural winner of the Moriyama RAIC International Prize was Li Xiaodong, of China, who will sit on the 2017 jury. All submissions are due by March 8, 2017 and the winner of the 2017 Prize will be announced on September 19, 2017. **https://moriyama.raic.org**

Plug-In by Jari Lonka, Francesco Allaix and Lilja Mustila in Helsinki, Finland. Runner-up in the Large-scale Interventions category. Photo Credit: Jari Lonka, Francesco Allaix & Lilja Mustila

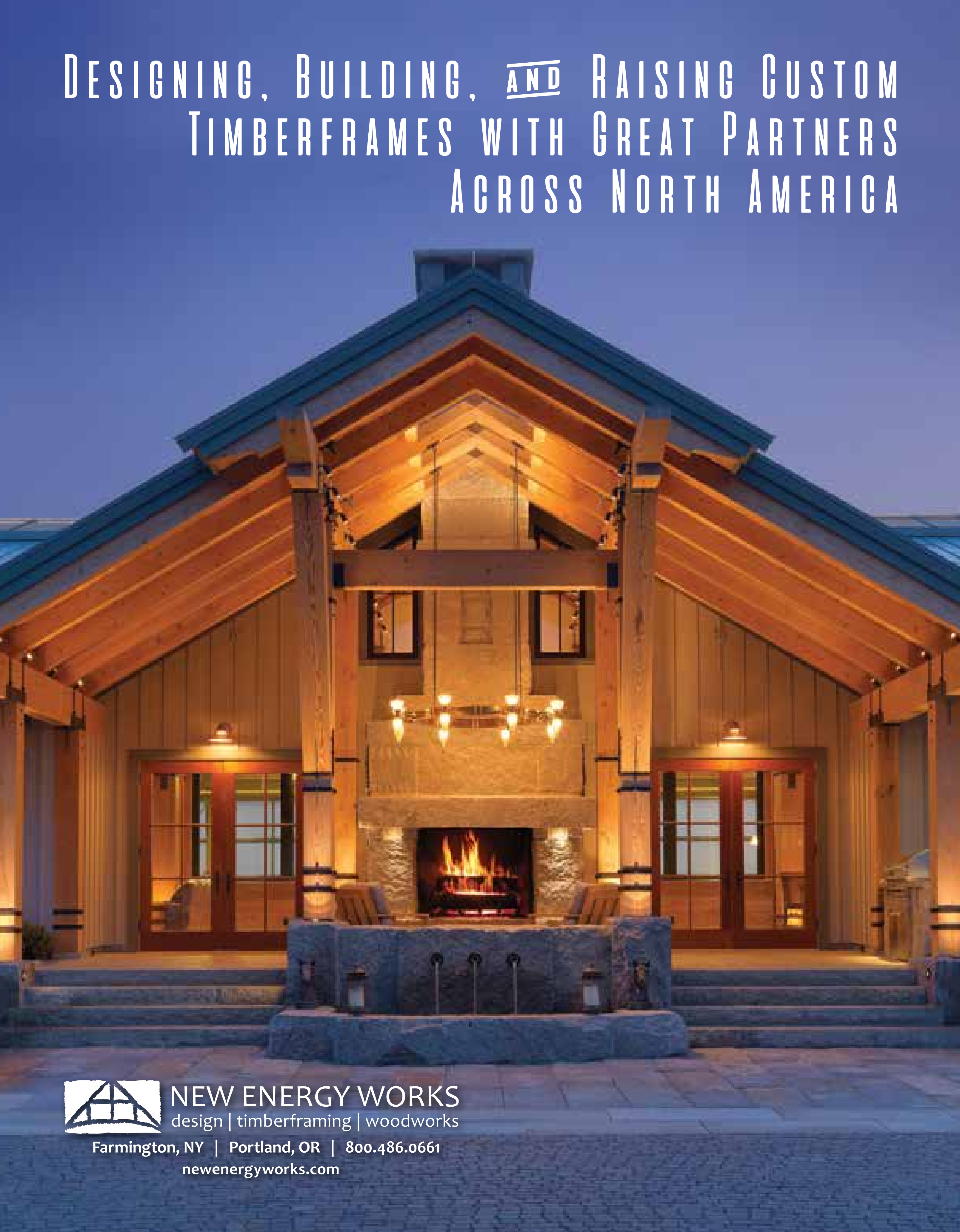
Young Architects Create Urban Solutions

Metsä Wood's "City Above the City" competition called for architects to design wooden extensions to city centres. Entries came from more than 40 countries, proposing wooden solutions to the challenges of urbanization. Winning designs were awarded to architects in New York, Shanghai and Tampere, Finland. Architects created their Plan B for urbanization using wood (Kerto LVL – laminated veneer lumber) as the main material. The task was to design a wooden extension to an existing urban building. Michael Green from MGA architects and DBR (Design Build Research), who chaired the jury, is happy that many young architects agree that construction must become more sustainable while cities stay liveable. Winners received awards in two categories: small-scale intervention and large-scale intervention. The total value of the prizes was EUR 35,000. The first prize winners in the small-scale intervention category were Nile Greenberg (USA) for his design for New York and Alma Studio (Spain) for their design for Shanghai. The first prize winners in the large-scale intervention category were Lisa Voigtländer (Germany) and SungBok Song (Korea) for their design for Tampere, Finland. **www.metsawood.com**

Stimson Lumber CEO Elected 2017 AWC Chairman

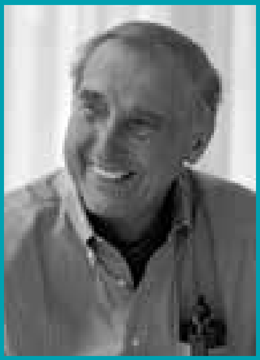
The American Wood Council (AWC) recently announced the election of Stimson Lumber CEO Andrew Miller as the new AWC chairman for a one-year term, effective January 2017. The full AWC board of directors includes:

- Chairman Andrew Miller, Stimson Lumber;
- First Vice-Chairman Allyn Ford, Roseburg Forest Products;
- Second Vice-Chairman Danny White, T.R. Miller Mill Company;
- Immediate Past Chairman Tom Corrick, Boise Cascade
- and, Aubra Anthony, Anthony Forest Products; Furman Brodie, Charles Ingram Lumber Co.; Fritz Mason, Georgia Pacific; Marc Brinkmeyer, Idaho Forest Group; Neil Sherman, LP Corporation; Mike Dawson, Norbord, Inc.; Eric Cremers, Potlatch Corporation; George Emmerson, Sierra Pacific; Joe Patton, Westervelt; Jim Rabe, Masonite; Adrian Blocker, Weyerhaeuser Company; and Michael Giroux, Canadian Wood Council.


Designing, Building, and Raising Custom Timberframes with Great Partners Across North America
NEW ENERGY WORKS
design | timberframing | woodworks
Farmington, NY | Portland, OR | 800.486.0661
newenergyworks.com

2016 WOOD DESIGN AWARDS

JURORS



PETER BOHLIN
Principal
Bohlin Cywinski Jackson
www.bcj.com

BRIAN COURT
Partner
The Miller Hull Partnership
www.millerhull.com

PATRICIA PATKAU
Principal
Patkau Architects
www.patkau.ca

Wood Design & Building magazine is pleased to announce the recipients of the 2016 Wood Design Awards. A jury panel selected 17 winning projects, including seven international entries, from 184 submissions.

All projects demonstrated a commitment to architectural excellence in wood. Special awards were also granted by the Canadian Wood Council as well as this year's award sponsors, Sansin, Sustainable Forestry Initiative (SFI) and Real Cedar.

In partnership with the Canadian Wood Council, *Wood Design & Building* would like to thank everyone who participated in the 2016 Wood Design Awards program. A special thank you is extended to Sansin, SFI, Real Cedar, as well as our esteemed jurors. Congratulations to the winners!

NORTH AMERICAN

HONOR

WILD TURKEY BOURBON VISITOR CENTER, Lawrenceburg, KY
De Leon & Primmer Architecture Workshop

IN SITU, San Francisco, CA
Aidlin Darling Design

MERIT

MICHIGAN LAKE HOUSE, Leelanau County, MI
Design Architect: Desai Chia Architecture, Architect of Record: Environment Architects

NEWBERG RESIDENCE, Newberg, OR
Cutler Anderson Architects

NORTH MAIN, East Hampton, NY
Bates Masi + Architects

LINEAR CABIN, St. Germain, WI
Johnsen Schmaling Architects

LAKESIDE AT BLACK BUTTE RANCH, Black Butte, OR
Hacker

POINT HOUSE, Upper Kingsburg, NS,
MacKay-Lyons Sweetapple Architects Limited

CITATION

GRANDVIEW HEIGHTS AQUATIC CENTRE, Surrey BC
HCMA Architecture + Design

T3 (TIMBER, TECHNOLOGY, TRANSIT), Minneapolis, MN
Design Architect: MGA | Michael Green Architecture, Architect of Record: DLR Group

INTERNATIONAL

HONOR

WRAP, Matsuyama city, Ehime prefecture, Japan
APOLLO Architects & Associates

INOUT HOUSE, Santa Ana, Costa Rica
PAAS (Puigcorbé Architects Associates) and MKBstudio

THE SMILE, Chelsea, London, UK
Alison Brooks Architects

MERIT

NANJING WANJING GARDEN CHAPEL, Nanjing, Jiangsu, China
AZL Architects

IMMANUEL CHURCH AND PARISH CENTRE, Cologne, Germany
Sauerbruch Hutton

MONT BLANC BASE CAMP, Les Houches, Vallée de Chamonix, Region Rhones-Alpes, France
Kengo Kuma & Associates

CITATION

SAMUEL BECKETT CIVIC CAMPUS, Dublin, Ireland
Bucholz McEvoy Architects

CANADIAN WOOD COUNCIL AWARDS

CABOT LINKS LODGE, Inverness, Cape Breton, NS
Fowler Bauld & Mitchell

WOODSHED, Pomfret, VT
Birdseye Design

SANSIN – SPONSORSHIP AWARD

CHIPPEWAS OF NAWASH UNCEDED FIRST NATION NEW ELEMENTARY SCHOOL, Cape Croker, ON
MMC Inc. Architects

SUSTAINABLE FORESTRY INITIAVE – SPONSORSHIP AWARD

LAKESIDE AT BLACK BUTTE RANCH, Black Butte, OR
Hacker

REAL CEDAR – SPONSORSHIP AWARD

LAKESIDE AT BLACK BUTTE RANCH, Black Butte, OR
Hacker

PHOTO CREDIT: Roberto de Leon
(De Leon & Primmer Architecture Workshop)

Wild Turkey Bourbon Visitor Center

De Leon & Primmer Architecture Workshop

Located on a bluff overlooking the Kentucky River, the Visitor Center is the newest component of recent additions and expansions to the Wild Turkey Distillery Complex, one of seven original member distilleries of the Kentucky Bourbon Trail. The 9,140-sq.ft. facility houses interactive exhibits, a gift shop, event venues, a tasting room and ancillary support spaces. The design approach draws on the concept of duality, bridging tradition and innovation through elements that are deliberately both familiar and new. Utilizing a simple barn silhouette, an interpretation of Kentucky tobacco barns common to the area, the building presents a clear and recognizable marker at the scale of the landscape. Clad in a custom chevron pattern of stained cypress siding, the simplicity of the barn form is contrasted by the intricacy of the building skin at closer range, creating a shifting sense of scale and tactility that is deliberately both simple and complex. Alternating areas of light-filtering lattice blur the boundaries between inside and out, light and dark. By night, the solidity of the dark structure transforms into a delicate, glowing filigree lantern perched above the river. The project employs forms, materials and patterns that are common to the region and to the bourbon-making process, but are expressed in unexpected ways. While the building evokes a traditional wooden tobacco barn with its black pitch coating, the proportions (particularly the roof outline) are exaggerated and relate more to the monumental scale of the nearby bourbon-aging rickhouses. Typical vertical barn plank siding has been reinterpreted into a chevron “plumage”, a nod to the brand’s iconic wild turkey mascot. The dark exterior stain also offsets a maintenance issue peculiar to bourbon-producing regions: it minimizes the need to clean off a non-toxic black fungus (which feeds on evaporating bourbon distillates) that gradually darkens building exteriors.

PHOTO CREDIT: Matthew Millman

In Situ

Aidlin Darling Design

Located in the heart of San Francisco’s dense urban cultural district, In Situ occupies and expands the space previously inhabited by the street front cafe of the San Francisco Museum of Modern Art. As a unique and separate program of the museum’s spacious expansion, this new, full-service restaurant is accessible both through the existing museum atrium, as well as directly from the street. In the dining room, solid ash tables are refined with a translucent white top stain, evocative of a tablecloth covering, allowing the subtle character of the wood to telegraph through. The final communal table anchoring the dining room lifts this “veil” of the white stain, presenting the highly figured rectangular slabs of ash to full view; an object of art in itself. A sculptural wooden ceiling canopy was designed as an expressive spatial element to create both a linear gesture to and from the street, while also providing an intimately scaled dining room area within the larger shell of the restaurant. HVAC, lighting, and life safety elements were integrated into the primary slatwork of thin-sliced sugar pine boards, while multiple series of thicker sugar pine sections swell out, responding to the seating areas below. The lead edges of the ceiling slats and boards have white-washed and rough sawn surfaces which are animated by light and shadow. The back cut of the large wood slats toward the dining room were sanded and oiled, a continued gesture to the rough and refined manifest in the wood’s surface. The ceiling wood was pre-coated in a clear fire retardant sealer prior to assembly within the space, allowing for full thickness lumber to be used as a ceiling element within a restaurant space.

PHOTO CREDIT: Jordi Miralles

INOUT house

PAAS (Puigcorbé Architects Associates) and MKBstudio

Evocative of a forest from another time, the atmosphere of nature through abstract composition is a mechanism to link the various spaces that make up the program of the house. The residence uses a single material – Melina wood – which is natural, local and recognizable. The wood forms seamless floor, wall and ceiling transitions. With the aim of achieving a natural texture, the wood has been protected with an open pore treatment that does not change its tone and allows transformation with time. Melina is a tropical wood with origins in India, that has been cultivated for more than 40 years in Costa Rica, mainly for interiors and furniture. Each of the exterior spaces presents a dynamic and rough texture, while the interiors present a smooth finish. This house establishes an uninterrupted inside-outside relationship; a sequence of layers between the open and the intermediary. Frontal boundaries are blurred by sheets of glass and vegetation, framed by two horizontal planes, floor and ceiling, where the full and the void are related via a series of water, vegetation and sky. Lateral boundaries establish the full-void relationship via a series of solid materials that close transversal views. All bedrooms are arranged along the peripheries bordering the neighbors, leaving an intermediate space between volumes for social uses: kitchen-dining, living room, swimming pool, porch, and barbecue. Existing trees on the site were preserved, uncompromisingly piercing the spaces they occupy. A perimeter curtain of rope and vegetation delineates the limits of the building element, creating a gap of shadow and light that qualifies the space between.

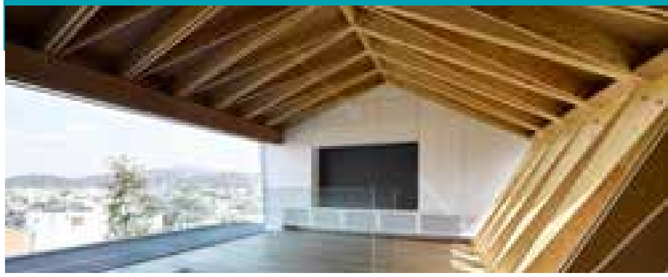


PHOTO CREDIT: Masao Nishikawa, Masao Nishikawa Photography Studio

Wrap

APOLLO Architects & Associates

This house is built into the hill in Matsuyama city, where the aim was to create a house most suited for the features of site. The main structure of this house is wood and the architects were able to create one horizontal wide opening – an upper observatory – by removing columns. The contrast between the bold observatory and sophisticated detail is unique and adds depth to the space. The structure is composed of SPF lumber and structural LVL (Laminated Veneer Lumber), and as each component is connected it forms curved triangle lattice. The detail is carefully designed to be as simple as possible. The architectural lighting is specifically designed for the structure and creates beautiful shadows that express the depth and rhythm of space. Up here, the family can enjoy the marvelous scenery of daily life.

PHOTO CREDIT: Alison Brooks Architects

The Smile

Alison Brooks Architects

The architect collaborated with The American Hardwood Export Council (AHEC), Arup and the London Design Festival to present a cross-laminated tulipwood structure called, The Smile, at the Chelsea College of Art Rootstein Hopkins Parade Ground. The Smile, one of the Festival's Landmark Projects, can be inhabited and explored by the public. The spectacular, curved, tubular timber structure measures 11.5 ft high, 14.5 ft wide, and 111.5 ft long. Showcasing the structural and spatial potential of cross-laminated American tulipwood, The Smile is a huge, curved hollow tube. It touches the ground at one point, like a wheel. Entering The Smile through an opening where the curved form meets the ground, visitors can walk from end to end to discover a new kind of space that gradually rises toward light. All four sides of The Smile's interior are made of the same hardwood panels as the structure. It offers a complete sensory experience of color, texture, scent, and sound. The Smile's two open ends illuminate the funnel-like interior space and act as balconies overlooking the city.

Ark Encounter

Heavy timber replica of Noah's Ark represents first phase of a large, family-oriented attraction

Williamstown, KY

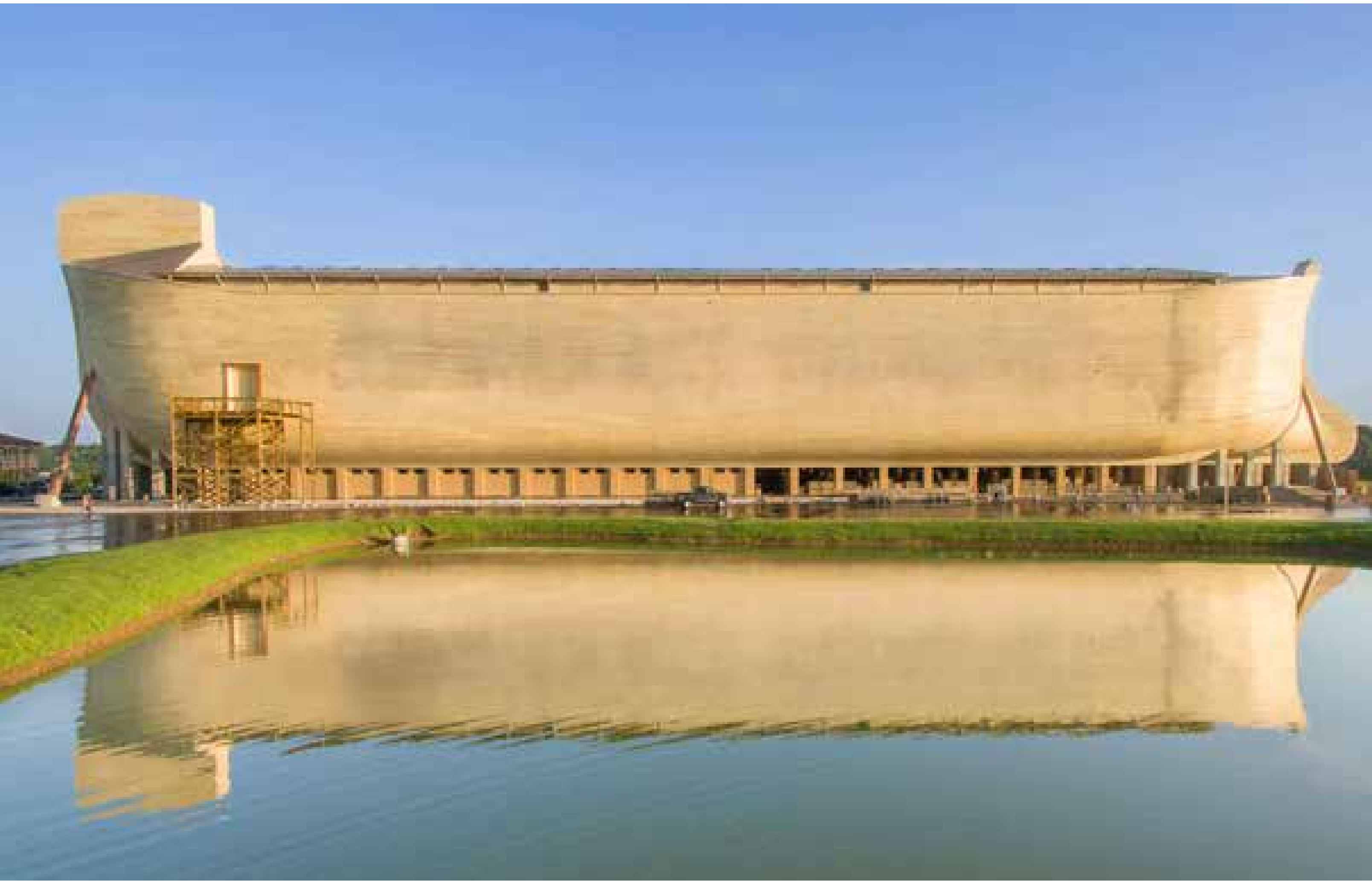
The architect commissioned for this project was tasked with the design and construction of a full-size replica of Noah's Ark. Standing at 104 feet tall and 510 feet long, containing more than three million board feet of wood, the modern engineering marvel opened July 7, 2016. The team faced many challenges throughout the process given the size, uniqueness and location of the project.

The minimal written accounts of the original structure posed the first challenge. The architect took the client's vision and, through extensive research, was able to develop the final project. Expert help from Tim Lovett, Australian professor and historian on wooden ships, aided in development of the basic form and shape of the Ark. Designing and building a ship as true as possible to the biblical account while meeting modern code requirements was a major task.

The site topography also presented challenges; the Ark Encounter is located on 800 rolling acres in the Ohio River Valley of northeast Kentucky. When the team first took over the site, construction was impossible. Preparing the location and underground structure for the Ark was a feat in and of itself. Environmental challenges and design issues required 1.7 million cubic yards of rock and dirt to be moved and 6,500 cubic yards of concrete to be poured for footings, foundations and piers.

Site work also included water services, sanitary sewer, installation of utilities, improvements to the highway serving the site, and the design of a tram road and 130-foot-long bridge for transporting visitors from a 4,000 space parking lot to the attraction. Minimizing environmental impact was also important. Minimizing the number of trees to be felled, reducing impact on local waterways, orienting the Ark so it could take maximum advantage of wind and sun for heating and cooling, as well as using sustainable building materials, were all part of the process.

Wood is the primary building material. Through close attention to detail, the beauty of the wood was preserved throughout the entire facility, from the exterior cladding, to the flooring, structural members, ramps and railings. The ship was designed to meet the definition of heavy timber construction with a minimum wood dimension of six inches and greater. The timber erection and carpentry work involved more than a dozen Amish carpentry crews from Indiana, Kentucky, Ohio, Pennsylvania, Georgia, Tennessee, Maryland, Illinois, and Wisconsin.



The wood utilized in the Ark was specifically chosen for its strength and was responsibly sourced. Engelmann spruce and Douglas fir were selected for their ability to carry heavy loads and handle 120-mph winds. The Ark stands 104 feet tall from ground level to the top of the wood sail. Resisting the wind pressure at the bow and stern required six diagonal braces anchored to concrete abutments on the ground level.

Southern yellow pine laminated wood members shaped like hockey sticks form the exterior ribs and are 6 ¾ inches x 22 inches thick and placed at six feet on center. They were treated with a fire retardant to meet the required fire performance rating for the exterior wall cavity. The largest laminated members were 12 inches x 60 inches, for a total of 680 lineal feet, for the center keel. These timbers continue to the full height of the wood sail.

In the atrium space of the structure there are 64 logs, 50 feet long, with a minimum diameter of 32 inches at the base, and 56 logs a minimum of 20 inches in diameter x 26 feet long. Douglas fir floor joists are 16 inches x 18 inches, six feet on center, across the full width and length of the ark. These joists are supported by 16 x 20-inch girder beams. In addition to the logs that support the atrium, there are 64, 20-in. x 20-in. x 32-ft.-long rough-sawn square columns and 64, 18-in. x 18-in. x 18-ft. long square columns, along with heavy timber diagonal bracing for each heavy timber bent that is 18 inches on center, for the entire length of the ark.

After considerable research and consultation with the U.S. Forest Service's Forest Products Laboratory in Wisconsin, the team settled on Accoya, a Radiata pine, acetylated treated wood, for the exterior cladding. As the wood weathers, it will turn a natural gray.

The Ark Encounter was built in 54 weeks including the first day heavy timbers were set to the completion and grand opening. At the same time the Ark was being constructed, the team also designed and built a heavy timber restaurant, with seating for 1,200 people, adjacent to the ship. The restaurant features a two-story wraparound porch and was completed in four months.

CLIENT
Answers in Genesis
Petersburg, KY

ARCHITECT
Troyer Group
Mishawaka, IN

STRUCTURAL ENGINEER
Troyer Group
Mishawaka, IN

Tamarack Grove Engineering
Boise, ID

GENERAL CONTRACTOR
Troyer Group
Mishawaka, IN

TIMBER SUPPLIER
Colorado Timberframe
Lafayette, CO

PHOTOGRAPHY
Answers in Genesis
Petersburg, KY

One Main Office Renovation

CNC-milled LVL brings office to life

Boston, MA

This project involved the renovation of the penthouse offices of a green building and clean energy technologies investment group. The design drew from prior work to propose that all interior elements be milled from sustainably forested spruce plywood using CNC machining.

The project focuses on two planes, the floor and ceiling, both of which are articulated as continuous surfaces. The curvilinear forms express both the digital genesis and the seamless fabrication logic. As much as possible, typical industrial components such as vents and door handles were replaced with articulate milled timber. This offered a radically streamlined protocol for delivering a well-crafted interior. The intention was to offer a reduced carbon footprint while celebrating a high level of detail finesse. This allowed the architect to fully customize all elements of the building. Other than sprinklers, lights, glass and hinges, the substance of the interior architecture was realized via this singular material and fabrication logic through a high degree of prefabrication.

The client asked that office chairs be purchased (for liability reasons) but all shelves, desks, benches, and storage units, were fabricated in plylam via the same method. The architect devised automated algorithms for generating milling files, passing from design to fabrication seamlessly and with high tolerances and extremely low percentages of error.

The design was conceived parametrically in celebration of the indifference of the CNC machine to formal complexity. The entire project was nested onto 1,200 sheets of 4 x 12 plywood and milled using a small three-axis CNC router, which effortlessly carved the ply sections according to prescribed "weeping" tool paths. More than one million linear feet of cuts were made, yet the process was highly accurate. Assembly was straightforward given the accuracy of the milling process, allowing the team to enjoy the elegance of the emerging forms.

The project was nuanced down to the smallest detail, including inflection of the ventilation grille for the computer boxes to provide a handle to open the door; even the door handles were carved as customized elements, proving cheaper than stainless steel D- handles.

There was efficiency in maintaining surface continuity, where large and highly accurate prefabricated parts were quickly installed on-site without the need for multi-component assembly. This was manifest in benches that curl out of floors and reception desks that emerge as inflections from the general floor.

One Main is a showcase for an atypical use of laminated veneer lumber (LVL). The entirety of the wavy wooden surfaces was built from cross-bonded LVL panels that are usually used as purely structural components.

CLIENT
C Change Investments/Zero+
Cambridge, MA

ARCHITECT
dECOi
Boston, MA

GENERAL CONTRACTOR
Tricore
Hingham, MA

TIMBER SUPPLIER
Metsä Wood
Fort Gratiot, MI

PHOTOGRAPHY
Anton Grassl Photography
Boston, MA

PROJECT FACTS

Wood
Sustainably forested Finnish spruce ply with non-toxic, water-based glue

Size
10,000-sq.ft

Material details
1,200 sheets of 1.5” thick, 4 x 12 ply, milled locally by a single three-axis milling machine. Tooling paths (more than one million linear feet cut), with no plans or sections, just 3-D instructional files.

Wastage
Approximately 10%; pulped and recycled.





Aspen Root Passive Home

Prototype home incorporates research by the Cold Climate Housing Research Centre, local suppliers and materials, and passive building principles

Gimli, MB

The Aspen Root Passive Home is the result of a 25-year journey for the owners who both work in the environmental industry and are committed to living a sustainable and low-impact lifestyle. From the outset, the owners and the design team established goals which would guide the project to completion: to create a home that was highly energy efficient, durable, and constructed with natural materials and finishes that require little or no maintenance.

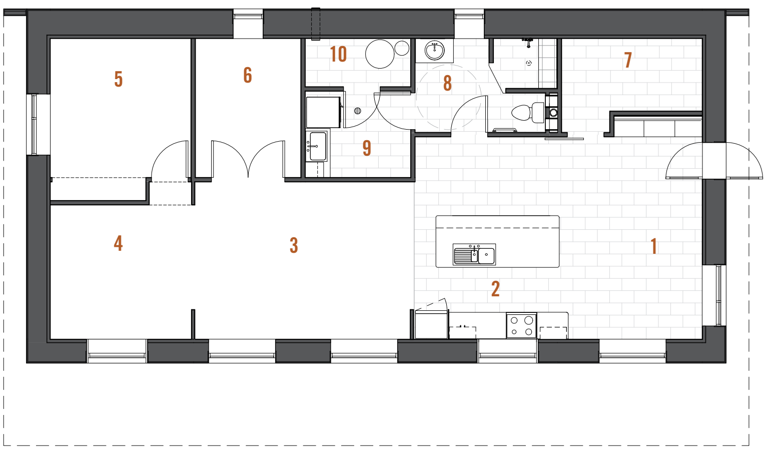
In order to measure success, the Passive House standard was selected early on. Passive House is a rigorous building standard that focusses on the building envelope with the primary objective of reducing heat loss through superinsulation, air tightness, high-performance fenestration, minimized thermal bridging, and high efficiency heat recovery.

The home is located 50 miles north of Winnipeg, MB, near the shores of Lake Winnipeg in the Aspen parkland ecoregion. Orientation and building shape were carefully determined. Through energy modeling, the window locations, sizes, and roof overhangs were optimized to allow maximum solar gain during the winter months while remaining shaded in summer.

The wall assembly was inspired by the Larsen truss, a superinsulated wood framing system used successfully across North America. In order to meet comfort levels required by Passive House in this climate zone, more than 18 inches of insulation were required for the walls, a much thicker depth than the 12 inches typical of Larsen truss walls. To accommodate this thickness, a parallel chord wood wall truss was used, similar to that of the roof and floor. The placement of plywood sheathing on the interior face of the walls and ceiling with taped joints to form the vapor barrier and provide air tightness is a unique feature of the wall system. On the ceiling, good-one-side Douglas fir plywood is used as sheathing and exposed with wood battens covering the taped joints. The walls are furred-out and finished with gypsum board to form a service chase. The walls and roof use a vapor-permeable reinforced house wrap specifically designed for use with dense-pack cellulose without exterior sheathing. This increases drying potential to the exterior. Fully vented rainscreen cladding shields the whole home. The use of vapor open materials on both sides of the wall allows superior drying performance and promotes long-term health and durability of the wall assembly.

The exterior design and materials reinforce the importance of passive principles in the home – facing the sun, exterior walls are clad using Western red cedar shiplap with a rough-sawn face. The more closed north wall is clad with standing seam metal which wraps down from the roof. The exterior beam and columns supporting the roof overhang are rough sawn cedar and finished using a pine tar wood preservative. On the interior of the home, the plywood ceiling, trim and millwork are all finished using a manufactured oil and wax.

The kitchen cabinets and other millwork case bodies and drawer boxes are NAUF (no added urea formaldehyde) veneer core plywood with veneer NAUF particleboard core door and drawer fronts faced with Douglas fir shiplap to recall the exterior cladding. The overall result is a warm interior that speaks to the industrial quality of the exterior through simple detailing and exposed ductwork.



1. east living
2. kitchen
3. west living
4. open office
5. master bedroom
6. bedroom/studio
7. storage/gym
8. washroom
9. laundry
10. mechanical

FLOOR PLAN

ARCHITECT
Bridgman Collaborative Architecture
Winnipeg, MB

STRUCTURAL ENGINEER
Wolfrom Engineering
Winnipeg, MB

GENERAL CONTRACTOR
Sundial Building Performance
Winnipeg, MB

PHOTOGRAPHY
Lindsay Reid
Winnipeg, MB

www.rigidply.com

Rigidply Rafters Inc. Engineers and manufacturing capabilities can help turn your vision into reality. *Let the natural beauty of wood* - **Glue-Laminated Timbers** - *bring the performance, stability, and charm to your project.*

701 E. Linden Street, Richland PA 17087 • Phone: (3717) 866-6581 • Fax: (717) 866-7237
1283 Joni Miller Road, Oakland MD 21550 • Phone: (301) 334-3977 • Fax: (301) 334-9289

www.rigidply.com

Güssing Agricultural School

Continuous canopy roof provides protection from the weather in all parts of the complex

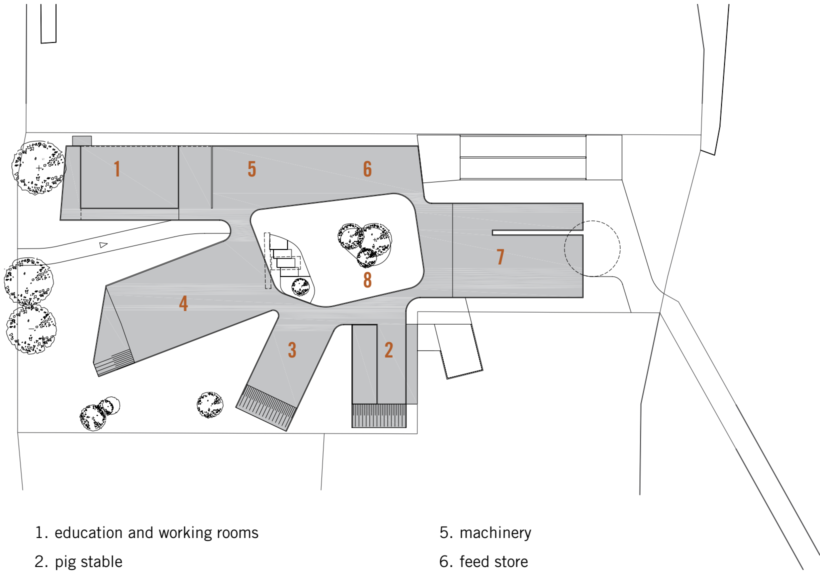
Güssing, Austria

This project involved the construction of an entirely new complex for the Güssing Agricultural School in Güssing, Austria. The alternative proposal, to retain and adapt parts of the existing complex, was rejected because renovating the existing buildings would still not provide the facilities required to run the school. During the design phase it was also revealed that the required dimensions of the complex meant successful integration of parts of the existing complex were practically impossible.

The new complex focuses on stables which are laid out around a central courtyard. This allows short routes and a clear overview from every point in the yard. This layout also allows the staff to carry out their daily work with maximum efficiency. A continuous canopy roof provides protection from the weather for all parts of the complex. The three stables extend like fingers into the surrounding landscape; the buildings are enveloped by open spaces, air and sunlight, providing the animals with a connection to the surrounding outdoor spaces.

The complex looks more like a cluster than a traditional four-square farm or a bastion. The buildings, consciously interpreted as part of the landscape, are folded out of the surrounding meadows; their roofs like elevated grass scars. The entire development is a loosely scatted agricultural enterprise, not a compact industrial complex.

A services wing closes off the northwest and offers protection from the elements. A teaching wing forms the start of the complex. This is the part of the school that is most often visited by the general public so the riding hall is also located here. Most of the building materials used can be recycled and were produced in a way that makes the best economic use of resources. The green roofs, for example, help buffer the impact of the summer heat; the rainwater feeds into the public separate drainage pipe; the earth excavated during the course of the construction will be used for modeling the surrounding terrain.



1. education and working rooms
2. pig stable
3. horse, sheep and goat stable
4. riding hall
5. machinery
6. feed store
7. cattle stables
8. central courtyard

SITE PLAN

In principle, three different levels are articulated in the structural design; each one is expressed by a different construction system: the parts that rest on the ground are made of concrete, the rising walls are built in lightweight timber frame or timber rod construction, and the roofs are load-bearing wooden structures and covered with extensive green planting. The most suitable construction method and material was chosen for each aspect of the structure and optimized for maximum efficiency.

CLIENT
BELIG-Beteiligungs- und Liegenschafts GmbH
Eisenstadt, Austria

ARCHITECT
Pichler & Traupmann Architekten ZT GmbH
Wien, Austria

STRUCTURAL ENGINEER
RWT PLUS ZT GmbH
Vienna, Austria

GENERAL CONTRACTOR
Bauunternehmung Granit GmbH
Feldkirchen bei Graz, Austria

PHOTOGRAPHY
Paul Ott/pxt mik
Graz, Austria

Density Conversion for Connector Capacity Calculations

Maik Gehloff

Modern timber connectors installed on wood. Photo credit: Herrmann's Timber Frame Homes

When planning to use modern, novel timber connectors or systems that are not covered by codes like the National Design Specifications (NDS) or CSA 086 (in the U.S. and Canada respectively) or covered by approval reports like CCMC in Canada or ICC in the U.S., the available design specifications or design guides may need to be adjusted to comply with local codes and standards.

Historically, commonly used connectors and systems have largely been imported from Europe. These connectors or systems are governed by European codes and regulations for timber construction and are either code-approved and embedded in the EN1991 (more commonly known as EuroCode 5 (EC5)) or covered by European Technical Approvals (ETA). For these products, a little familiarity with the design standards of the country of origin can give insight into an effective design approach and what to do when converting capacities to local standards to be used in conjunction with the codes and standards of the home jurisdiction.

In the common scenario of European systems covered by EC5 and ETAs used in conjunction with the NDS and CSA 086 in the U.S. and Canada respectively, here are some pointers on what needs to be considered in the conversion process.

The most notable difference between the NDS (US), EC5 (Europe), and CSA 086 (Canada), is the design to Allowable Stresses (ASD) versus Load Resistance Factors (LRFD). Although the NDS has LRFD provisions, they aren't commonly used. ASD is preferred. Compared to ASD, the LRFD provisions in the NDS are largely conversions and adjustments rather than semi-probabilistic approaches found in CSA 086 and EC5. Further considerations have to be taken when it comes to converting to capacities compatible with ASD.

Almost all aspects of timber connection design with dowel type fasteners, regardless of EC5, CSA 086 or the NDS, are based on the density of the timber species used. The U.S. National Design Specifications and the Canadian CSA 086 use the same approach when it comes to density; both specify the mean relative gravity G for oven-dry wood for certain species or species mixes. In contrast, the EN 1991 specifies wood densities as characteristic density ρ_k (or ρ_{ch} depending on the language) at 12% moisture content for softwood regardless of the species. The density given by EC5 is given kg/m^3 whereas the nature of relative gravity is unitless making the conversion, at least from a unit's point of view, easy. The relative gravity is given relative to water representing a gravity G = 1.00 and a density ρ_w = 1,000 kg/m^3.

Although the order in which the full conversion is done doesn't really matter, if tables are being used for the conversion the recommended first step is to adjust for the moisture content. The oven-dry relative gravity needs to be converted to density at a moisture content of 12%. The Wood Handbook, from the Forest Products Laboratory, is a great resource for designers and covers the topic of wood water relationships and densities (Chapter 4) well. I highly recommend getting a copy of this tremendous resource either in print or the free PDF version from the USDA website (www.woodweb.com/Resources/wood_eng_handbook/wood_handbook_fpl_2010.pdf). The book offers different approaches to the conversion either by using tables or using equations.

First, we need to establish what exactly we convert as there are various combinations on how densities for wood are established. The North American timber design standards use oven-dry weight and oven-dry volume, while the European standard uses weight and volume at 12% moisture content. The conversion can be done as follows to convert from oven-dry to 12% moisture content for the example of Douglas fir.

Table 1: Volumetric Shrinkage (adopted from Table 4-3 of the Wood Handbook)

Species	Volumetric Shrinkage (%) from green to oven-dry
Douglas fir	
Coast	12.4
Interior North	10.7
Interior West	11.8

$$G_g = G_0\left(\frac{100 - S_0}{100 - S_g}\right)$$

with,

G_g = *specific gravity (oven − dry weight, green volume)*

$G_0 = G$ = *relative gravity (as given in CSA 086 and NDS)* = 0.49 *(example Douglas − fir)*

S_0 = *percentage of volumetric shrinkage, Table 1 above or Wood Handbook Table 4 − 3*

S_0 = 12.1 *(average between coastal and interior west) in example*

S_g = 0 *(no volumetric change in this case, both oven − dry)*

$$G_g = 0.49\left(\frac{100 - 12.1}{100 - 0}\right) = 0.431$$

$$G_x = G_g/(1 - S_x/100)$$

$$S_x = S_0\left(1 - \frac{\textit{Moisture Content (12\%)}}{FSB}\right)$$

with,

FSB = ~ 30% *(per Wood Handbook)*

$$S_x = 12.1\left(1 - \frac{12\%}{30\%}\right) = 7.62$$

$$G_x = 0.431/(1 - 7.62/100) = 0.467$$

$$\rho_x = \rho_w G_x\left(1 + \frac{\textit{Moisture Content (12\%)}}{100}\right) = 1000 \cdot 0.467\left(1 + \frac{12}{100}\right) = 523.04$$

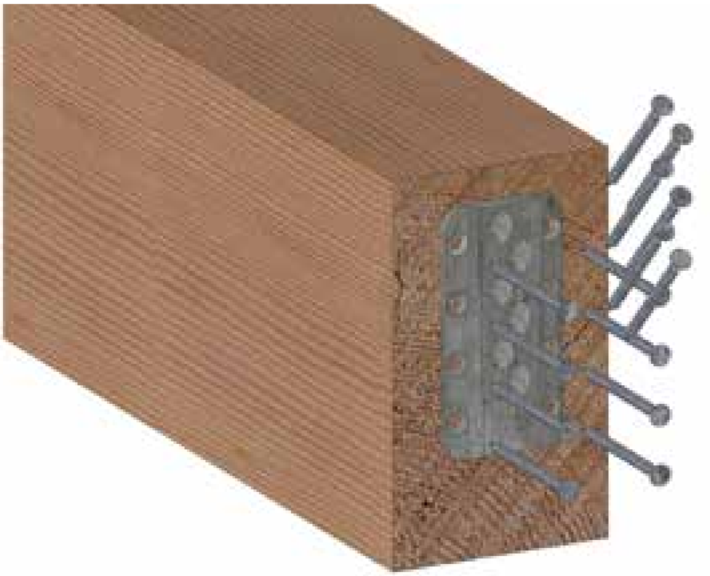
(note: subscript x indicates the moisture content, x = 12 in our case)

The second step in the conversion, however, is of a statistical nature and converts the mean value as used in the NDS and CSA 086 to characteristic or 5th-percentile value used in EC5 and thus basis for all ETAs. The commonly adopted statistical distribution for wood properties used in codes is a normal distribution making conversions from mean to percentile values relatively straight forward without the need to know maximum and minimum values or the standard deviation for the mean value. Using the now-converted density $\rho_{12\%}$ as an example, per NDS/CSA 086 for Douglas fir, that value represents the mean value that would need to be converted to a characteristic density.

$$\rho_{ch,12\%} = \rho_{12\%} \cdot 0.84 \ \textit{(statistical conversion factor)}$$

$$\rho_{ch,12\%} = 523.04 \cdot 0.84 = 439.35 \rightarrow 439\ kg/m^3$$

With the conversion of densities completed, either EC5 or ETAs and their design provisions/equations can be used to establish the characteristic capacity (5th percentile value) of the connector or system. The characteristic value now needs to be factored to attain the design capacity, or allowable capacity



Rendering of modern timber connector installation.
Rendering by Gehloff Consulting Inc.

for the NDS, of the connector/system in question. Euro Code 5 uses a semi-probabilistic approach with partial safety factors or load resistance factor design. Canada's CSA 086 uses a similar approach, making the conversion or calculation of the design capacity somewhat straight forward. Although the NDS has provisions for LRDF, it is recommended to follow a slightly different approach to get an allowable capacity. The EuroCode 5 uses the Material Safety Factor (i.e. solid sawn timber, glulam, timber connections, …) combined with other factors that consider load duration and service conditions into one modification factor. The approach is similar for CSA 086 although the Material Safety Factor is not expressed as such but rather part of the specified strength/capacity provided in the code and further adjusted with various factors depending on failure mode, load duration and so on.

In case of the NDS, the recommendation would be to use the EC5 components with a load duration/service condition factor (combined into one) representing permanent loading as the NDS uses permanent loading as the starting point instead of short-term loading as is the case for EC5 and CSA 086.

Maik Gehloff, DI (FH), MASc, is the founder and owner of Gehloff Consulting Inc. as well as a Senior Lab Instructor at the University of Northern British Columbia's Masters of Engineering in Integrated Wood Design program. Maik Gehloff holds a Dipl.-Ing. (FH) degree in Wood Science and Technology specializing in timber engineering from the University for Applied Sciences in Eberswalde, Germany, as well as a MASc in Timber Engineering from University of British Columbia (UBC) in Vancouver. Maik is a member of the Timber Framers Guild of North America as well as the Timber Frame Engineering Council. He can be reached at mgehloff@gehloff-consulting.com.


A whole
new era for
jack hangers.


©2017 Simpson Strong-Tie Company Inc. LSSJ16D

Brown is the NEW GREEN

Henry Walthert

Photo Credit: Jane Hebert

A visit to a local lumber retailer to purchase pressure treated wood reveals there is no "green wood" aisle, and with good reason. Over the last few years, manufacturers of pressure treated wood have shifted production to products containing brown colorants in response to market demands for more aesthetically pleasing structures.

Brown colored treated wood has quickly become the norm as market acceptance has grown. The opportunity to build projects with brown treated wood, thereby avoiding the need to stain after construction, is a significant factor appealing to both the professional and do-it-yourself market.

New technologies developed by wood preservative manufacturers have allowed wood treaters to add dyes or pigments during the pressure treating process to mask the greenish color usually associated with pressure treated wood products. The green color is a result of the copper contained in the wood preservatives that was, until recently, commonly accepted for outdoor wood structures.

While most residential products are available in brown, the green products have not completely disappeared. Many commodities – especially those for industrial or commercial uses such as utility poles, guard rails and bridge timbers – are still green as they have been for more than 50 years.

Residential applications make up about 80 per cent of the market for pressure treated wood products with the balance used for industrial/commercial projects.

Why treat wood?

We are fortunate to have an abundance of forest lands which provide us with the most environmentally friendly building material available. Extending the service life of these products is the reason behind pressure treating with wood preservatives. By applying wood preservatives, we can protect wood against decay organisms like fungi and insects.

Most sawn timber, round wood, and plywood, as well as specialty products such as lattice, spindles, etc., can be pressure treated with preservatives. The natural characteristics of wood dictate the treatability of various species. Commonly treated species in Canada include: red pine, jack pine, SPF, lodgepole pine, Hem-Fir (a product which mixes Western *hemlock* and Amabilis *fir),* and Douglas fir. To assist in the penetration of preservative, some species require incising (small knife like incisions) on the surface of the wood.

Residential consumer products available in retail outlets normally require less preservative than is required by heavy duty industrial/commercial products that are normally specified by engineers and architects.

Wood preservation standards

In Canada, the pressure treatment of wood products is governed by the Canadian Standards Association standard CSA O80 Series-15 Wood Preservation. This most recent version of the standard reflects updates in the types of products treated and the preservatives used.

In addition, the CSA standard continues to refine the use category (class) system for Canada. Traditionally, treated wood standards around the world were based on requirements for individual commodities but after significant work led by a team of international scientists, a model standard based on use categories (class) was published by the International Standards Association in 2007. ISO 21887 Durability of wood and wood-based products – Use Classes is now used as the model for the adoption of standards around the world.

The use category system classifies wood products based upon the degree of biological hazard associated with exposure to water, soil and agents of deterioration in different service conditions.

The ISO 218887 standard briefly describes the use classes as follows:

Use class 1	wood or wood-based product is under cover and fully protected from the weather and not exposed to wetting
Use class 2	wood or wood-based product is under cover and fully protected from the weather but where occasional, but not persistent, wetting can occur
Use class 3	wood or wood-based product is not under cover and not in contact with the ground – continually exposed to weather or protected from the weather but subject to frequent wetting
Use class 4	wood or wood-based product is in contact with the ground or fresh water and thus permanently exposed to wetting
Use class 5	wood or wood-based product is permanently or regularly submerged in salt water

The American Wood Protection Association (AWPA) and the Canadian Standards Association standards are modeled on the ISO standard. AWPA and CSA standards are similar in application of the classes however there are slight differences due to regional conditions.

Types of preservatives

Alkaline Copper Quaternary compounds (ACQ)
This preservative, composed of copper as the active ingredient, has long been recognized for its effectiveness against pathogenic organisms. The quaternary compounds provide additional protection against copper tolerant fungi and decay organisms. ACQ treated wood can be used inside or outside buildings, more specifically for decks, patios, fences and docks. It can be used in contact with the soil if it is treated for this application.

Copper Azole, Type B (CA-B)
Copper azole is composed of copper, the main active ingredient, and tebuconazole, which acts as a co-biocide. CA-B treated wood can be used inside or outside buildings, more specifically for decks, patios, fences and docks. It can be used in contact with the soil if it is treated for this application.

Micronized Copper Azole (MCA)
Micronized copper azole is a preservative based on micronized copper, a copper mechanically reduced to very small particles. This is a very recent technology in the Canadian market. The micronized copper-based system does not use any organic solvent for the formulation of the copper solution. Submicron copper particles (smaller than one millionth of a metre) are physically deposited in the wood cells in solid form. The copper microparticles are then fixed to the wood under pressure. MCA treated wood can be used inside or outside buildings, more specifically for decks, patios, fences and docks. It can be used in contact with the soil if it is treated for this application.

Disodium Octaborate Tetrahydrate "Borates" SBX
Classified as a borate oxide (SBX), disodium octaborate tetrahydrate (DOT) is the active ingredient of the borate wood preservative. It protects wood against many organisms, including decay fungi (wet or dry rot), wood-eating or wood-boring insects (furniture beetles, house longhorn beetles, bark beetles, carpenter ants) and subterranean termites, including the Eastern subterranean termite, one of the most voracious in the world. Borates are natural compounds composed of oxygen and boron, one of the 109 elements of the periodic table. When wood is protected from weather, the borates remain inert and are fixed to the interior of the wood without degrading or decomposing. However, they dissolve and can be leached if the wood is exposed to rainwater or excessive moisture. This is why borate treated wood is always used in applications protected from moisture and above ground. It is mainly used for lumber in regions where termites are present.

Chromated Copper Arsenate (CCA)
CCA is a product that contains inorganic arsenic, chromium and copper. In 2004, CCA was withdrawn voluntarily from the residential market, except for certain applications, such as permanent wood foundations. However, it should be noted that the chemical composition and toxicity of arsenic compounds vary significantly, depending on the type of arsenic used. Inorganic pentavalent arsenate, one of the main active substances in CCA, occurs naturally in trace amounts in soil, water, air, plants and the tissues of most living species, including humans. It must not be confused with trivalent arsenic compounds, which are generally more toxic and never used in the pressure treatment of wood. The Pest Management Regulatory Agency, Health Canada (PMRA) has created the document *Label Guidance for Use of Chromated Copper Arsenate (CCA)* on the authorized uses in wood treatment. A copy of the document can be obtained by contacting Wood Preservation Canada or the PMRA. CCA treated wood is mainly used for highway guardrail posts, utility poles, industrial and farm fence posts and piles, plywood for industrial use and for structures immersed in salt water or brine, as well as permanent wood foundations. It can be used in contact with the soil if it is treated for this application.

How to specify treated wood

To facilitate the work of treated wood producers, buyers and specifiers, the construction documents of a pressure-treated wood project should specify:

1. The product name (plywood, sawn timber and lumber, round poles, etc.);
2. The applicable use category;
3. A reference to the applicable standard (e.g. CSA O80 Series 015 – Wood preservation);
4. The desired wood species (e.g. Eastern hemlock, jack pine, red pine, etc.);
5. The desired wood preservative (e.g. CCA, ACQ, CA-B, MCA, etc.);
6. Any special requirements (e.g. preparation before or after treatment, conditioning, drying, etc.).

It is also very important for specifiers of treated wood products to consider that the different preservatives, in the same use environment, may react differently to the metals of fasteners, connectors and coverings. Many treated wood products are corrosive, so galvanized fasteners are recommended. Follow the recommendations of the preservative manufacturers in this regard.

Henry Walthert, CAE, is Executive Director, Wood Preservation Canada. He can be reached at henry@woodpreservation.ca.

Wood WARE

Splinter

The Splinter, the world's first wooden supercar, explores the limitations of wood and its performance characteristics. Joe Harmon, an industrial designer from Mooresville, NC, built and designed this one-of-a kind car from scratch with the help of a group of friends. Harmon's car showcases the strength-to-weight ratio of wood, which is stronger than both aluminum and steel. Inspired by the WWII de Havilland Mosquito plane that was made almost completely from wood, the majority of the car parts were fabricated from wood or wood composites. Species used include from maple, ash, birch, hickory, walnut, cherry, and oak. The body of the car is formed from woven strips of cherry veneer and the chassis is made from molded laminates. Harmon takes the Splinter to shows to encourage innovation and to prove just how much can be accomplished with wood.

www.joeharmondesign.com