

## UPCOMING DATES

### JUNE

4 Barrie Council, 7:00 p.m.

Brampton Committee of Council, 9:30 a.m.

Georgina Council, 9:00 a.m.

Mississauga General Committee, 9:30 a.m.

Richmond Hill Committee of the Whole, 9:30 a.m.

Vaughan Committee of the Whole, 1:00 p.m.

Vaughan Committee of the Whole (Public Meeting), 7:00 p.m.

Whitchurch-Stouffville Council, 1:00 p.m.

9 Brampton Planning & Development Committee, 7:00 p.m.

Brock Council, 10:00 a.m.

Burlington Committee of the Whole, 9:30 a.m.

Mississauga Planning & Development Committee, 6:00 p.m.

Pickering Planning & Development Committee, 7:00 p.m.

Uxbridge Council, 10:00 a.m.

Whitby Committee of the Whole, 7:00 p.m.

10 Aurora Committee of the Whole, 7:00 p.m.

Caledon Planning & Development Committee—Public Meeting, 7:00 p.m.



## SHIFT2025 CHALLENGE WINNER CONSIDERS THE POSSIBILITIES OF UNCONVENTIONAL BUILDING MATERIALS

# SOURCING MORE SUSTAINABLY



Lana Hall

One of this year's **Ontario Association of Architects** (OAA) SHIFT Challenge winners asks building professionals, including developers, architects, and construction managers, to consider a simple question: Do you know where your building materials are coming from and what will happen to them after their lifecycle ends? In a world of increasing carbon emissions, pollution, and the accumulation of micro-plastics, one solution could entail a return to more sustainable, regenerative building materials, such as straw, feathers, and recycled wood, the project team argues.

The SHIFT Challenge is an annual design competition hosted by the OAA that invites practitioners to consider the many ways architecture can be used to solve societal challenges. This year's SHIFT

Challenge theme was “reshaping communities,” a subject that highlights the potential role of architectural design in promoting stability, built form resilience, and fostering a sense of belonging. The sustainable materials entry “Speculative Assemblies,” was one of six winners chosen last month by the competition jury.

The project, led by **Carleton University** assistant professor of architecture **Jerry Hacker**, envisions a suite of sustainable construction materials that could be created from lumber offcuts, pine resin, feathers,

straw, burlap, beeswax, discarded fabric, and even coffee grounds. These raw materials can be processed and transformed into building components such as membrane panels, bricks, insulation, and cladding. Not only can these materials be sourced sustainably, says Hacker, but at the end of their life cycle, these products can be returned to the earth, resulting in a regenerative cycle.

“The international supply-chain system that supports the construction industry requires extensive shipping

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The planet is literally on fire. So for me, it just sort of demands that we re-evaluate what is it that we're doing here?... How can we radically question the ways in which we're putting buildings together currently?

- Jerry Hacker

### NRU PUBLISHING STAFF

**Ian A.R. Graham**, Publisher  
iang@nrupublishing.com  
Ext. 222

**Irena Kohn**, Editor  
irenak@nrupublishing.com  
Ext. 223

**Matt Durnan**, Senior Reporter  
mattd@nrupublishing.com  
Ext. 225

**Lana Hall**, Senior Reporter,  
lanah@nrupublishing.com  
Ext. 226

**Peter Pantalone**  
Planning Researcher  
peterp@nrupublishing.com

**Jeff Payette**  
Design/Layout  
jeffp@nrupublishing.com  
Ext. 228

**Samantha Lum**  
Sales and Circulation  
samanthal@nrupublishing.com  
Ext. 224

### NRU PUBLISHING INC

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NRU Publishing Inc.  
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M4W 1V5

**Mailing Address**  
NRU Publishing Inc.  
P.O. Box 75016  
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Toronto, ON M4W 3T3

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and generates carbon emissions, often benefiting corporations at the expense of marginalized communities and the environment,” reads the application submitted by the Speculative Assemblies project team. “Building assemblies can and should come apart readily to enhance end-of-use possibilities.”

For Hacker, who has divided most of his working life between teaching and practice, the climate crisis has lent new urgency to the challenge of interrogating mainstream construction practices in North America, particularly for students who will go on to practice architecture under a decidedly new normal.

“The planet is literally on fire,” he says. “So for me, it just sort of demands that we re-evaluate what is it that we’re doing here?... How can we radically question the ways in which we’re putting buildings together currently?”

Hacker is quick to point out that many cultures have used sustainable building materials successfully for centuries, and many still do, especially in the Global South and within Indigenous communities here in Canada.

“They’ve always had a respect for that; a use of materials that could return

themselves to the earth, whether that’s wood, hides, ice, snow,” he tells *NRU*. “These are all materials that you can use temporarily and then they return themselves to the earth. It’s not new in a sense, but the contemporary way that we build has somehow convinced ourselves it’s more ‘advanced.’”

Over the past 75 years, annual global plastic production has increased from 2 million tonnes to 450 million tonnes, with the construction industry being the second largest user of plastics, according to data

from the **Organisation for Economic Co-operation and Development (OECD)**. Not only does the production of this material result in high levels of pollution and greenhouse gas emissions, but these plastics do not degrade, resulting in the buildup of toxins over time, according to an OECD report published in 2017.

Hacker admits that convincing a North American developer to experiment with corn-based adhesive or insulation made from hemp could be a hard sell, especially if they’re looking to build at scale. That’s where access to the university comes in, where it’s easier to assemble and pilot some of these materials, which Hacker and his team have done with the 11 products proposed

in the Speculative Assemblies project. He hopes to test them further through a research program he’s involved with at Carleton’s Centre for Advanced Building Envelope Research (CABER).

“They have a facility where you can literally build these wall assemblies, put them in there, blast them with heat, blast them with water, and put sensors all the way through them and actually just monitor them.”

This testing process will be critical to helping building regulators understand the merits of these alternate materials, which is one of the only ways they will become more mainstream, says Hacker. He also thinks there’s a role for industry certification programs, such as LEED [Leadership in Energy and Environmental Design], to play in supporting more widespread

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Image of a building component made from reclaimed lumber, pine resin, and feathers. The concept is part of the Speculative Assemblies project, one of the Ontario Association of Architects' (OAA) SHIFT2025 Challenge winners. The project envisions a suite of sustainable construction materials that are created from lumber offcuts, pine resin, feathers, straw, burlap, beeswax, discarded fabric, and even coffee grounds. These raw materials can be processed and transformed into building components such as membrane panels, bricks, insulation and cladding. Not only can these materials be sourced sustainably, they can be returned to the earth at the end of their lifecycle.

IMAGE: SPECULATIVE ASSEMBLIES  
SOURCE: ONTARIO ASSOCIATION OF ARCHITECTS

# SOURCING MORE SUSTAINABLY

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use of sustainable materials, the way it did decades ago by encouraging manufacturers to produce low-VOC [volatile organic compounds] paint, which has now become the standard in new buildings.

SHIFT2025 jurors praised the Speculative Assemblies project for its alignment with the circular economy, a system of salvaging and restoring materials for use in future building projects, an approach slowly gaining traction in some corners of the construction and development industry (See: “*Diverting Matter: With Costs of Materials Rising, Landfill Space Declining, Cities Must Find New Uses for Construction Waste*”, NRU GTHA, Wednesday, April 20, 2022).

“Thinking outside the prefab box and beyond the catalogue,

this approach leads to sustainable building materials made out of something otherwise cast into the trash,” reads on anonymous juror comment.

“If whole-building life cycle assessment takes a deep dive into the extraction, manufacturing, construction, deconstruction, and recycling of materials while maintaining a low-carbon footprint, then this project embodies that approach seamlessly. It

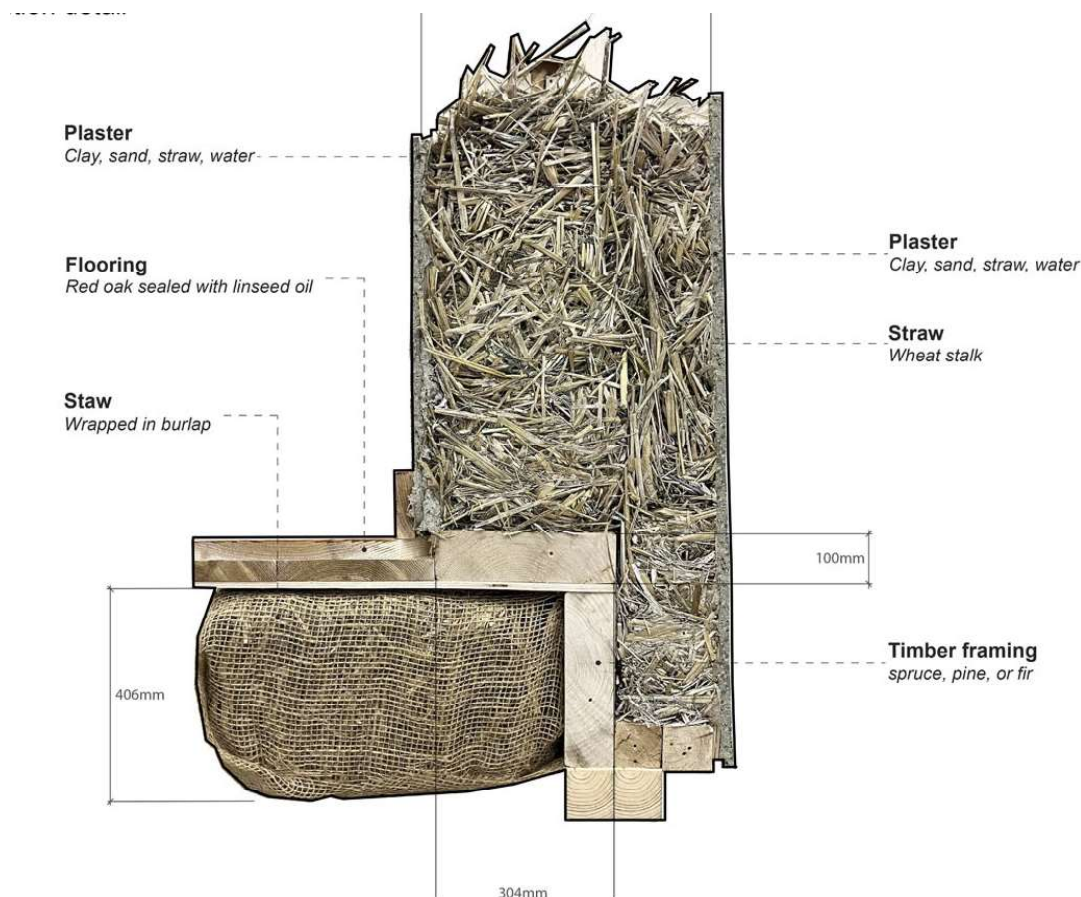
integrates the principles in an organic, earth-conscious way, demonstrating a thoughtful and holistic reimagining of sustainable biogenic building materials and assemblies,” reads another.

For Hacker, widespread adoption of these materials will require a mindset shift of “many, many people,” including developers and building owners who have traditionally prioritized longevity in their building materials, regardless of the consequences that may come with extracting and sourcing some of those materials, such as plastic.

“In some ways, these ways of building and these materials

demand for us to think about care and longevity in a slightly different way,” says Hacker.

“We put vinyl siding [on a building] because it’s going to be there forever and we’ll never have to touch it. We kind of think that’s the ideal ...but there’s a shift for owners to go, ‘Hmmm ... is that the right mentality to have?’” 🌱



Section detail from a submission to the Ontario Association of Architects' (OAA) SHIFT2025 Challenge. The project “Speculative Assemblies: From Pine Needles to Pressed Coffee” was recognized by the OAA as one of six winning selections from the biennial aspirational ideas competition. The project considers alternative building materials and practices that could replace plastics, toxins, and exploitive supply chains and promote sustainability and human and environmental health through the use of biodegradable materials in building construction.

IMAGE: SPECULATIVE ASSEMBLIES  
SOURCE: ONTARIO ASSOCIATION OF ARCHITECTS