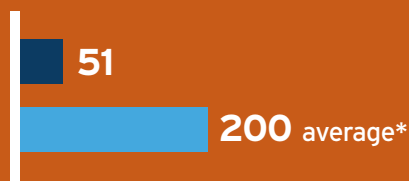


## Case Study: Baysville Eco Duplex

Demonstrating how pre-fab building and natural materials can unite to create a bright, sustainable and comfortable multi-family dwelling, Toocketree Passive Homes and Fourth Pig Green & Natural Construction built this passive 2,542-square-foot duplex in 2021. The home is super insulated with recycled, plant-based, dense-pack cellulose insulation. Wood fibre board wraps the entire building to provide a continuous thermal break. Smart interior and exterior membranes provide airtightness while protecting the building envelope. The duplex also features a super energy efficient heating and cooling system with a ducted air source heat pump, Hepa filtered energy recovery ventilation system, zero-VOC paints and sealants, LED lights throughout, and extra soundproofing between units and bedrooms.

### Embodied Carbon

Cradle-to-gate, kg CO<sub>2</sub>e/m<sup>2</sup>



\*Average based on report from 2022.

### Reduction Strategies



SEED panels  
prefabricated indoors  
5km from build site



Minimal waste with  
automated and  
precision construction



Minimized fossil fuel  
usage for transport  
and construction



Carbon-storing natural,  
recycled, and plant-  
based materials

### Carbon Storage



Blown-in cellulose  
insulation



Wood fibre  
board



Denim batt  
insulation



Sustainably  
harvested wood

**5**

tons of CO<sub>2</sub> stored



“

**We're so excited to be building resilient, comfortable, healthy homes for people here that not only sustain the community but are also responsible and responsive to the environment.**

**Rick Zytaruk, Co-founder and CFO of Toocketree Passive Homes**

**Operational Carbon** | Through the use of computer-automated machinery, conservation-oriented building practices and a controlled indoor environment, Toocketree minimizes construction waste while producing SEED (Sustainable, Ecological, Efficient, Durable) Passive House panels using carbon-sequestering natural materials.



Prefabricated  
Passive House  
SEED panels

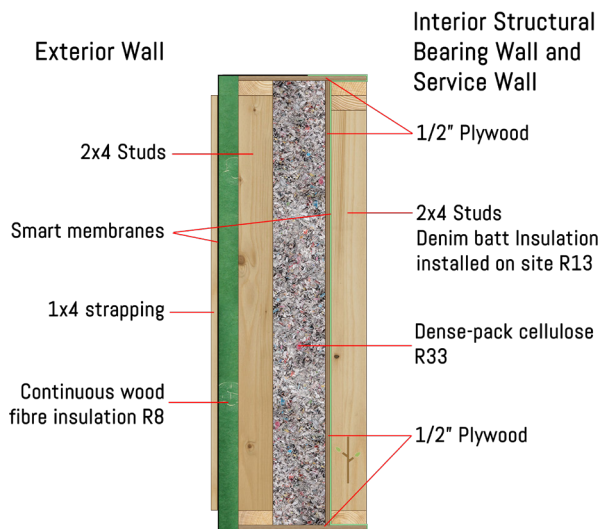


Ducted air source  
heat pump



Energy recovery  
ventilation system

## SEED Wall Panel Cross Section



## Super-insulated walls to suit the Northern Ontario Climate

The home is super insulated with 14.5" thick walls. The exterior 9" wall cavities are filled in the factory with recycled, plant-based, dense-pack cellulose insulation. Triple-glazed windows provide ample natural light while conserving comfortable conditions indoors. The interior is clad in natural finishes that include sustainably harvested (FSC) engineered hardwood flooring and solid wood trim and doors. Builders cladded the exterior with a long-lasting metal roof and siding.

Installation of prefabricated wall panels

## Lessons Learned

1. Quality assurance (good record-keeping) must be prioritized for streamlined coordination among trades.
2. A variety of options for sealing the envelope is optimal (tape, membrane, gaskets, insulation).
3. We are not alone! There is a community of green builders willing to share knowledge and problem-solve.

## Project Information

Project name: Baysville Eco Duplex

Location: Baysville, Ontario

Builder: Toocketree Passive Homes, Fourth Pig

Green & Natural Construction

Year built: 2021

Typology: Duplex

Size: 1,331 SF GFA front unit | 817 SF GFA rear unit