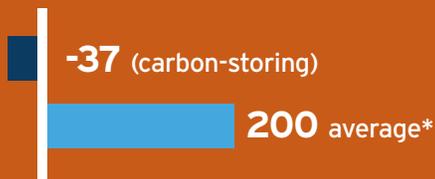


## Case Study: Burlington Terra 600

The Terra 600 is the third in New Frameworks' line of panelized pre-constructed homes. Built for a family in Burlington, VT as an infill project on their urban property, the pre-designed manufactured approach provided a financially-accessible home without compromising the ecological, health, and performance qualities of the home. Straw and wood fiber-insulated panels form the floors, walls, and roof of this 580 square foot home featuring full kitchen, bathroom, open living space, and bedroom, complete with balanced ventilation and all-electric heating and cooling.

### Embodied Carbon

Cradle-to-gate, kg CO2e/m<sup>2</sup>



\*Average based on report from 2022.

### Reduction Strategies



Carbon-storing straw insulated wall panels



Helical piers to eliminate concrete foundations



All-wood framing and exterior cladding



Durable metal roofing lasting the lifetime of the building

### Carbon Storage



Straw insulated wall panels



Wood fiber fill roof and floor insulation

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



Photo by New Frameworks

This charming home nestles into the site on this urban property; the vented rainscreen siding was milled from local timber.



**Our built environment needs to model our values, and housing made of New Frameworks' straw panels connect us to the land, food systems, and help heal our planet.**

Grace Oedel, Executive Director of the Northeast Organic Farming Association

**Operational Carbon** | The panelized air-tight (~1 ACH50), super-insulated, thermally-broken enclosure created a low-load energy profile that allowed this building to be easily conditioned using high-efficiency heat pumps for heating and cooling. Balanced ventilation with energy recovery provides efficient fresh air delivery to the home, and a heat pump hot water provides energy-efficient domestic hot water. Natural daylighting coupled with LED lighting further reduces electrical loads for this fossil-fuel free home.



Airtight panelized construction



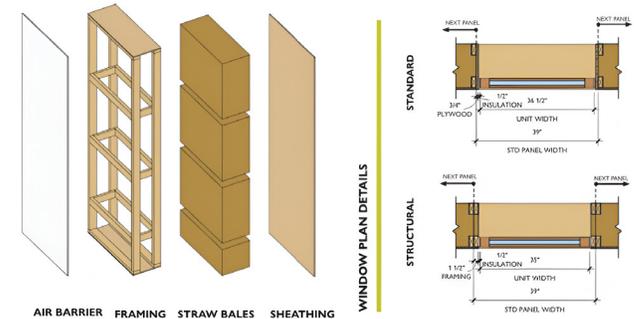
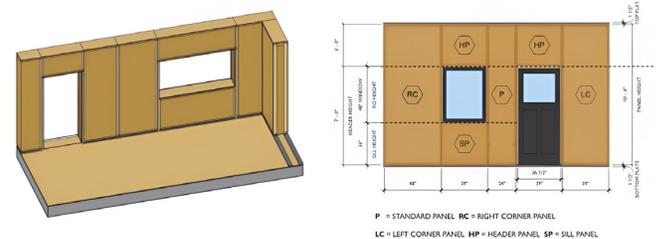
Super-insulated, thermally-broken enclosure



High-efficiency heat pumps



New Frameworks Panels being installed for the Terra 600 walls. The straw in these panels stores over 6,000 kg of CO<sub>2</sub>e! The panels are easily installed using a telehandler, and can be moved around on site easily to facilitate installation.



MATERIAL CARBON EMISSIONS BY SECTION			
Footings & Slabs	489 kg CO <sub>2</sub> e		
Foundation Walls	0 kg CO <sub>2</sub> e		
Structural Elements	176 kg CO <sub>2</sub> e		
Exterior Walls	-5,922 kg CO <sub>2</sub> e		
Party Walls	0 kg CO <sub>2</sub> e		
Exterior Wall Cladding	493 kg CO <sub>2</sub> e		
Windows	592 kg CO <sub>2</sub> e		
Interior Walls	235 kg CO <sub>2</sub> e		
Floors	119 kg CO <sub>2</sub> e		
Ceilings	50 kg CO <sub>2</sub> e		
Roof	711 kg CO <sub>2</sub> e		
Garage	0 kg CO <sub>2</sub> e		
<b>NET TOTAL</b>	<b>-3,057 kg CO<sub>2</sub>e</b>	-10,000	MCE (kg CO <sub>2</sub> e) 5,000

New Frameworks Panels are designed to be a drop-in replacement for site-built double stud wall enclosures. Full shop drawings are produced by an architectural team in Revit to facilitate project integration and bank more carbon in more buildings that would otherwise not have access to straw as an insulation material.

The design and construction of small homes comes with unique challenges. For example, architectural detailing and programming in small homes is harder than in larger homes. Also, mechanicals in small low-load homes are tricky - hard to find small enough equipment!

## Lessons Learned

1. Panelized construction provides opportunities for streamlined infill development.
2. Reducing embodied carbon does not inherently require additional costs, and can even save cost.
3. Plumbing services for buildings on piers in cold climates require additional planning.

## Project Information

Project name: Burlington Terra 600  
Location: Burlington, VT  
Builder: New Frameworks  
Year Built: 2024  
Typology: Single Family Home  
Size: 580 SF CFA / 770 SF GFA  
Cost: \$100,000 - \$250,000