

## Case Study: Vali Hideaway

Vali aims to reduce the carbon impact of their buildings while maximizing comfort, health, and functionality. By removing concrete and foam insulation and using biogenetic insulation and cladding products, Vali Homes has been able to cut the upfront carbon impact by 90%, compared to standard construction. The project also addressed the carbon impact of people moving from smaller homes to larger ones. The Vali Hideaway is an excellent alternative, allowing families to grow without the hassle and impact of moving or building. It can serve as a backyard office, extra sleeping quarters, or a full ADU with a simple kitchen, all designed for optimal health and acoustics.

### Embodied Carbon

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



\*Average based on report from 2022.  
84% less MCE than average new construction according to RMI data.

### Reduction Strategies



Concrete free, ground screw foundations



Wool and cellulose insulation



Pro Clima tapes and membranes for airtightness and waterproofing

### Carbon Storage



Wood framing



Wood insulation



Cellulose insulation



Accoya cladding



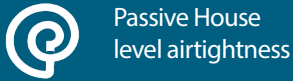
Photos by Austin Trautman



When one designs for health, they also tend to decrease carbon impact while increasing durability.

– Gerald Leenerts, Founder of Nopal

Vali Hideaway was built to Passive House level airtightness using Red List free materials that are designed to last well over one hundred years. The project also used Passive House certified windows with low solar heat gain, an Energy Recovery Ventilator (ERV), and a mini-split heat pump for space conditioning.



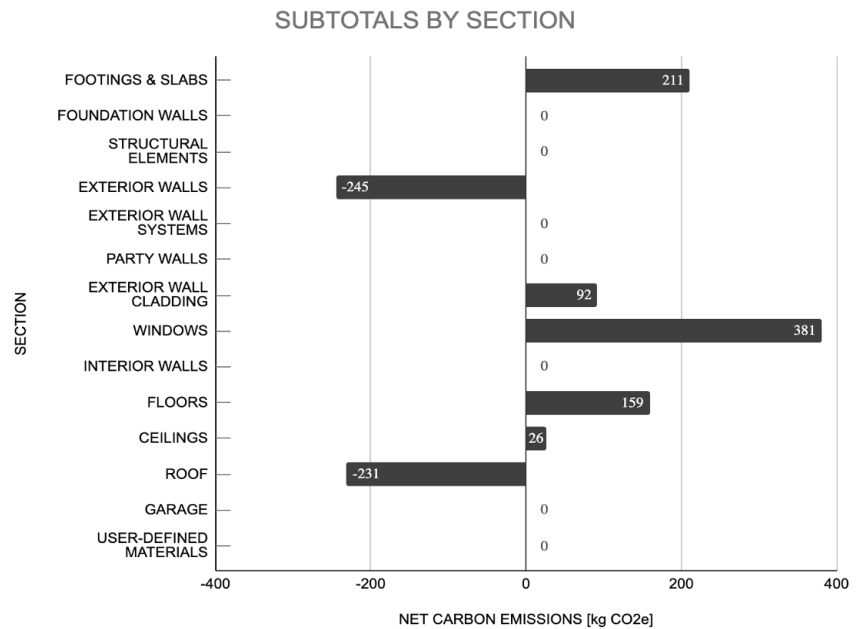
Passive House level airtightness



Energy Recovery Ventilator



Mini-split heat pump for space conditioning



<b>NET TOTAL</b>	<b>393</b>
<b>NET TOTAL PER SQ. METRE</b>	<b>30</b>

Vali Hideaway offers a versatile space that can function as an ADU/guest space, office, or storage. This radically low-carbon structure is notable for its innovative, eco-friendly construction methods, including the use of concrete-free materials and adherence to red-list free and Passive House standards. The advanced framing techniques, including thermal studs, drastically reduce thermal bridging by approximately 99%, and the use of ground screws in conjunction with a net carbon-storing loft system underscores the project's commitment to low-carbon building practices.

## Lessons Learned

1. Ground screws are hard to install and still have a decently high carbon impact. It isn't clear if avoiding concrete for foundations is worth it purely for carbon reduction.
2. T-Studs can be an effective thermal bridge reduction strategy when exterior insulation doesn't work for the project.
3. Carbon impact of new construction and deep remodels is very high so we should try to avoid these actions if there are quality alternatives.

## Project Information

- Project name: Vali Hideaway
- Location: Phoenix, AZ
- Builder: Vali Homes
- Year built: 2024
- Typology: Desert flatlands
- Size: 150 sf
- Cost: \$49,000 (build cost)