

A Home for People and Planet: Assessing the Feasibility of Sustainable Affordable Housing by Designing a Proof-of-Concept

Background

“Roughly 20% of US energy-related greenhouse gas (GHG) emissions stem from heating, cooling, and powering households,” (1) however those few sustainably built houses are fiscally inaccessible to the majority of the American public

Philosophy

“These dangerous times for Earth call not just for passion, intelligence, and hard work, but – more profoundly – a sense of optimism that is willing to act without a full understanding, but with a faith in the effect of small individual actions on the global picture”

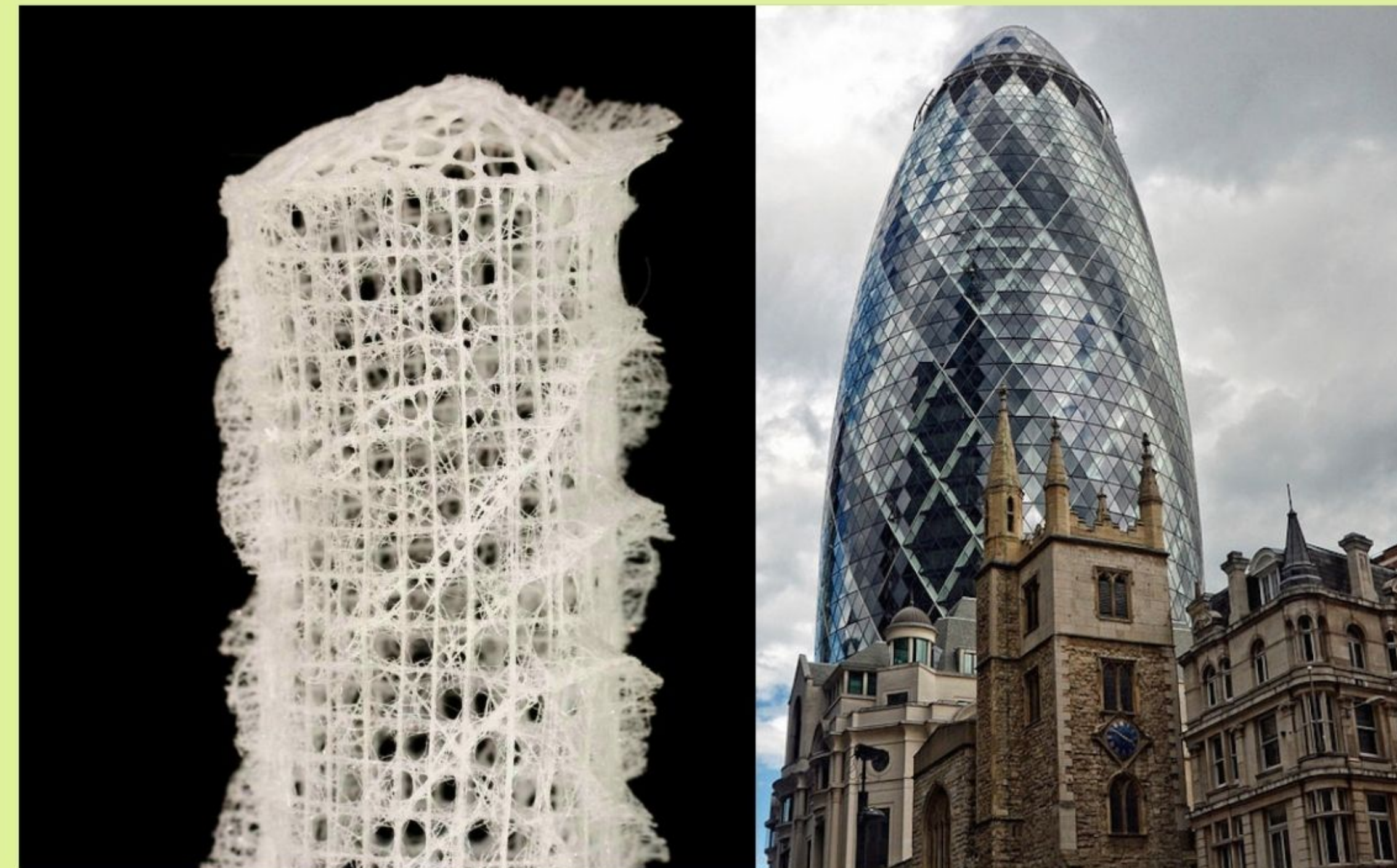
- designer and environmentalist VICTOR PAPANEK

Methodology

This project aims to answer the question: can green architecture also be affordable? To address this question, I plan to use the teachings of Earthships, Biomimicry, and Biophilic design to design an affordable green prefabricated home in the context of Wooster, OH.

Literature Review

BIOMIMICRY... Biomimicry, in its simplest terms, is the focus on copying techniques from nature to create more sustainable and efficient systems in all parts of human creation



BIOPHILIC DESIGN... Biophilic design evokes nature to positively impact on the environment and human wellbeing and stems from Biophilia which refers to the “inherent affinity people have for the natural world.” (3)



EARTHSHIPS... Earthships are autonomous, sustainable, houses made of recycled and reclaimed materials

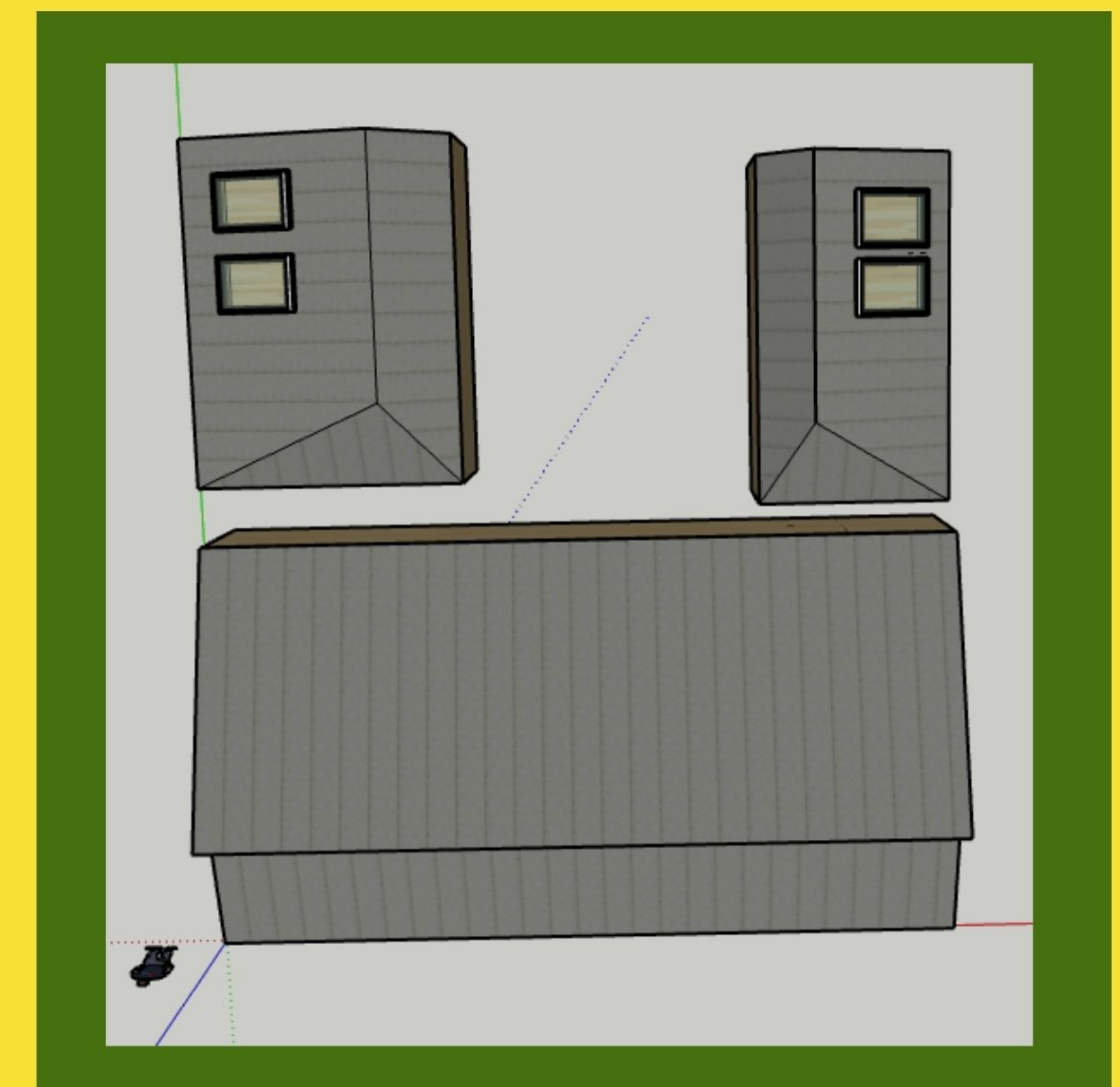


INDEPENDENT STUDY BY JENNIFER MYNARD

Results



The final design uses information gained from the interviews and the literature review. The primary elements integrated are greywater cycling, the use of photovoltaic cells, passive heating, three modules, the design for end of life (EOL) potential, and design intended to increase biophilic seasonal awareness. The design is a 3 module, prefabricated two-bedroom, two-bathroom, home.



REFERENCES

(1) Goldstein, Benjamin, et al. “The Carbon Footprint of Household Energy Use in the United States - PNAS.” Proceedings of the National Academy of Sciences of the United States of America, 20 July 2020, <https://www.pnas.org/doi/10.1073/pnas.1922205117>.

(2) Papanek, The Green Imperative, 10.

(3) Kellert, Stephen R. Nature by Design: The Practice of Biophilic Design. New Haven, CT: Yale University Press, 2018.