

Multiple Single-Family Homes

Four Neighbors, One Lot - Affordable Passive Houses built under SB 9 + ADU

Project Overview & Design Concept

The concept is that neighbors pool land and resources to create a micro-community of comfortable, energy-efficient, and fire-smart dwellings that they can afford with limited means—without giving up the dream of living in their own single-family home.

A similar SB 9 and ADU urban-infill project, completed by our office earlier this year, served as the inspiration for our submission to the Passive House Network and Passive House California “*California Rebuilds Design Competition*”.

The design envisions the creation of micro-communities—places where neighbors know and care for one another. The buildings are carefully scaled to blend into a variety of neighborhoods without overpowering the surrounding residential character.

Each unit is approximately 1,000 sq. ft., featuring two bedrooms, one and a half bathrooms, an in-unit washer and heat-pump dryer, and an open kitchen and living room layout that connects seamlessly to a private garden space.

The all-electric homes are designed to meet the rigorous International Passive House Construction Standard, a globally recognized benchmark for energy-efficient building design.

The project that inspired this urban infill submission are proudly certified Passive House Classic's by the International Passive House Institute (PHI), demonstrating that compact, small-volume buildings can achieve the airtightness levels of 0.45 ACH @ 50 Pa.

A Passive House achieves this through five core design principles:

1. Continuous Insulation – A continuous layer of high-performance insulation wraps the entire building, keeping indoor temperatures stable and reducing the need for mechanical heating and cooling. In warm climates, the focus is on limiting unwanted heat gain rather than retaining heat.
2. Airtight Construction – Careful detailing and testing create an extremely airtight envelope, one of the greatest benefits in Southern California. Airtightness improves energy efficiency and helps keep smoke and outdoor pollutants—such as wildfire particulates—out of living spaces.
3. High-Performance Windows and Doors – Windows are strategically placed and

shaded to reduce solar gain while maximizing natural daylight and cross ventilation.

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4. **Balanced Ventilation with Heat Recovery** – A dedicated ventilation system provides a constant supply of filtered fresh air while recovering energy from exhaust air. In warm climates, this system reduces cooling loads and maintains excellent indoor air quality even when windows remain closed during smoky or high-fire-risk days.
5. **Thermal-Bridge-Free Detailing** – All connections between walls, roofs, and foundations are designed to avoid “hot or cold spots,” improving comfort and reducing weak points where heat, moisture, or embers could penetrate.

The quality and attention to detail required to meet the Passive House standard is what sets it apart from conventional construction. A building is only as good as its weakest link—every joint, seam, and material choice matters. That same precision directly supports fire-resilient design: airtight construction, non-combustible insulation conserve energy while making it harder for wind-driven embers to enter.

Materials and Envelope

The exterior assembly combines stucco and fiber-cement board cladding with high performance aluminum-clad windows and doors, complemented by aluminum sunshades and louvers for passive solar control and a metal seam standing roof. A continuous layer of non-combustible stone wool insulation wraps the walls and roof, creating a “fire blanket” that provides both thermal protection and ignition resistance.

Site Planning and Landscape

Recognizing that no building can be fully fireproof, the design addresses fire risk from macro to micro scale. The site layout incorporates a fuel modification plan, providing defensible space, setbacks, and carefully selected plantings. Hardscape areas near the building reduce combustible materials at the perimeter.

Conclusion

This project demonstrates how architectural quality, energy efficiency, and fire resilience can be seamlessly integrated. The proposed residences not only exceed California’s energy and fire-safety requirements but also serves as a forward-looking model for urban, sustainable, climate-adaptive design in the Wildland-Urban Interface.