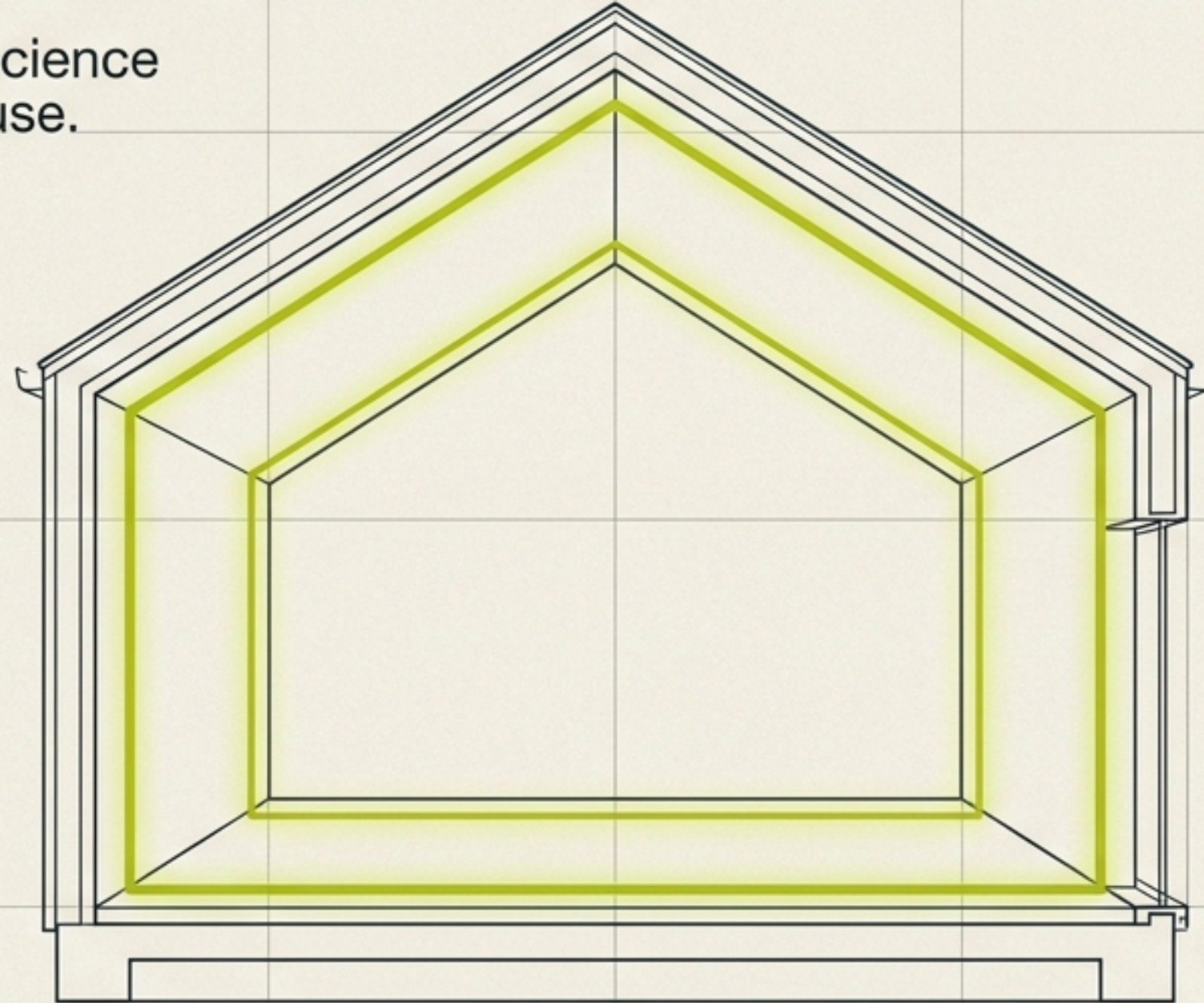
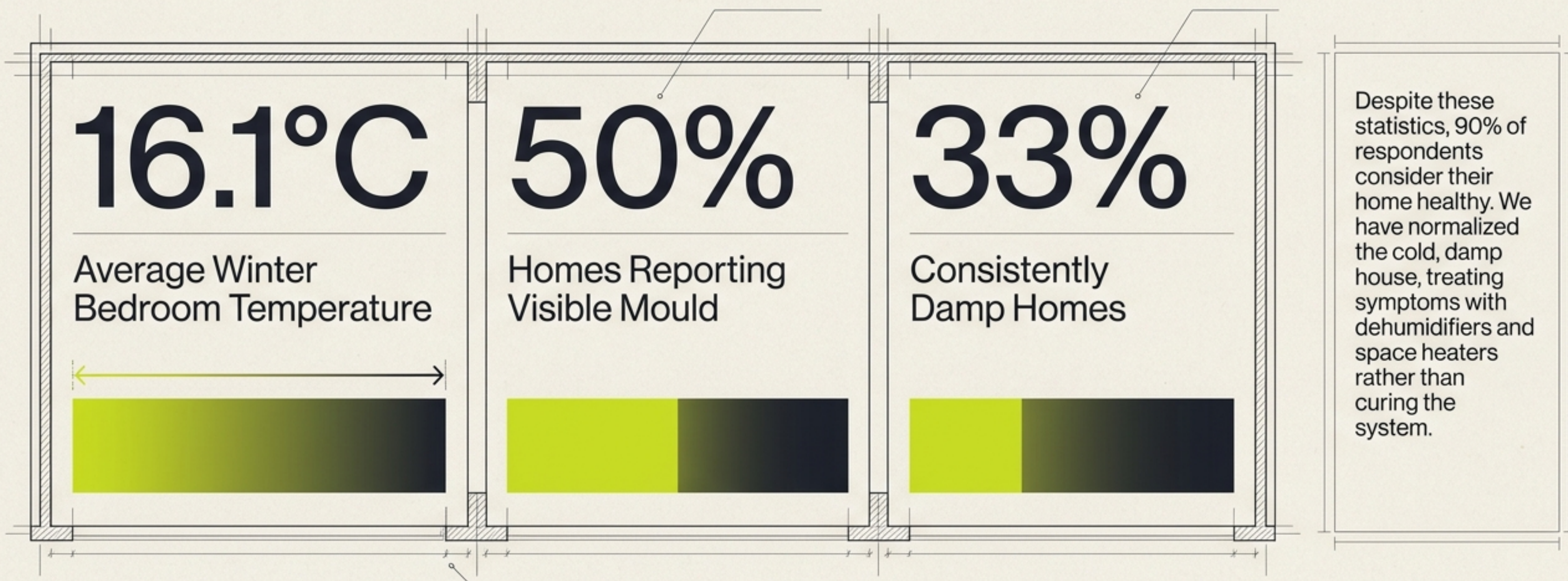


Anatomy of a High-Performance Home.

Demystifying the Building Science of the Certified Passive House.

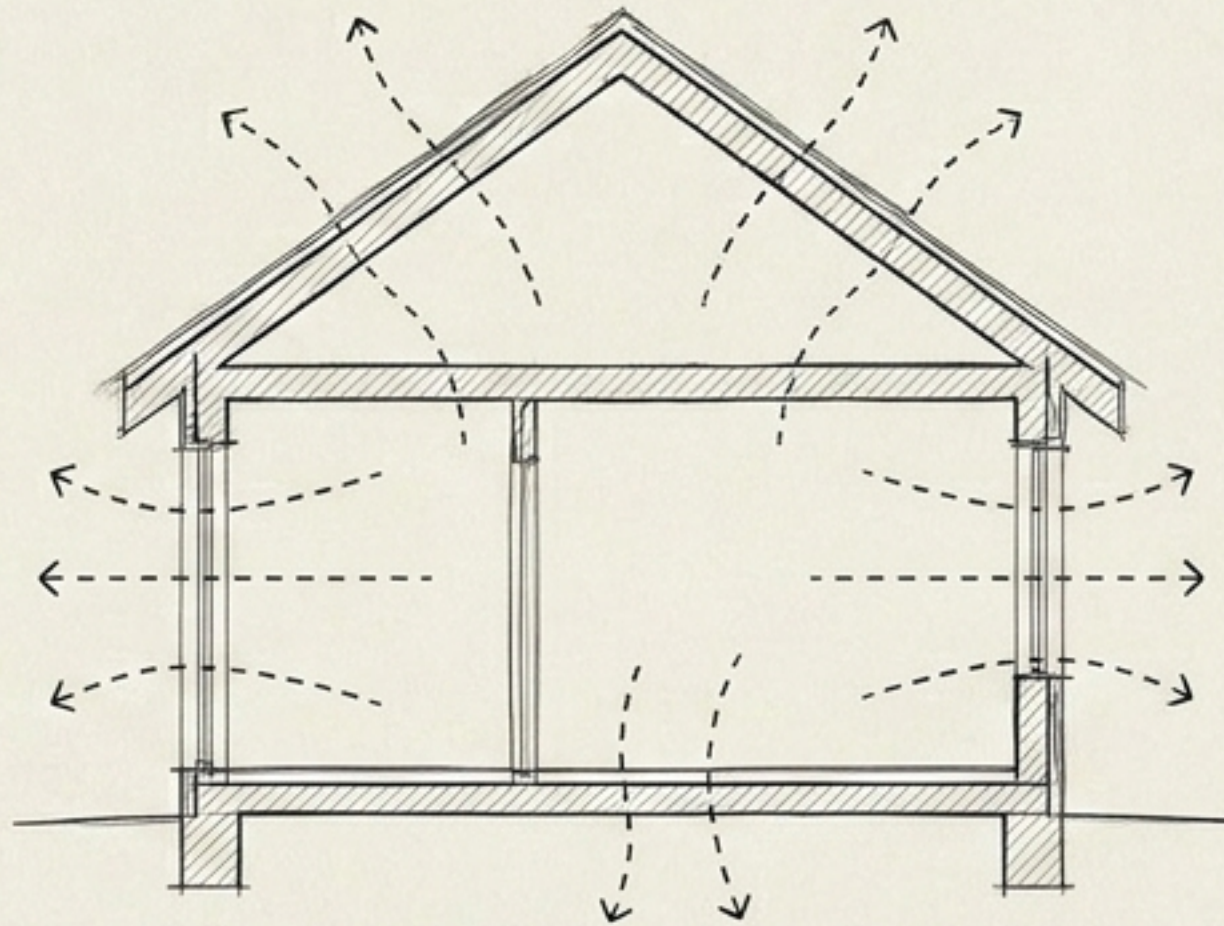


The Reality of the New Zealand Home.

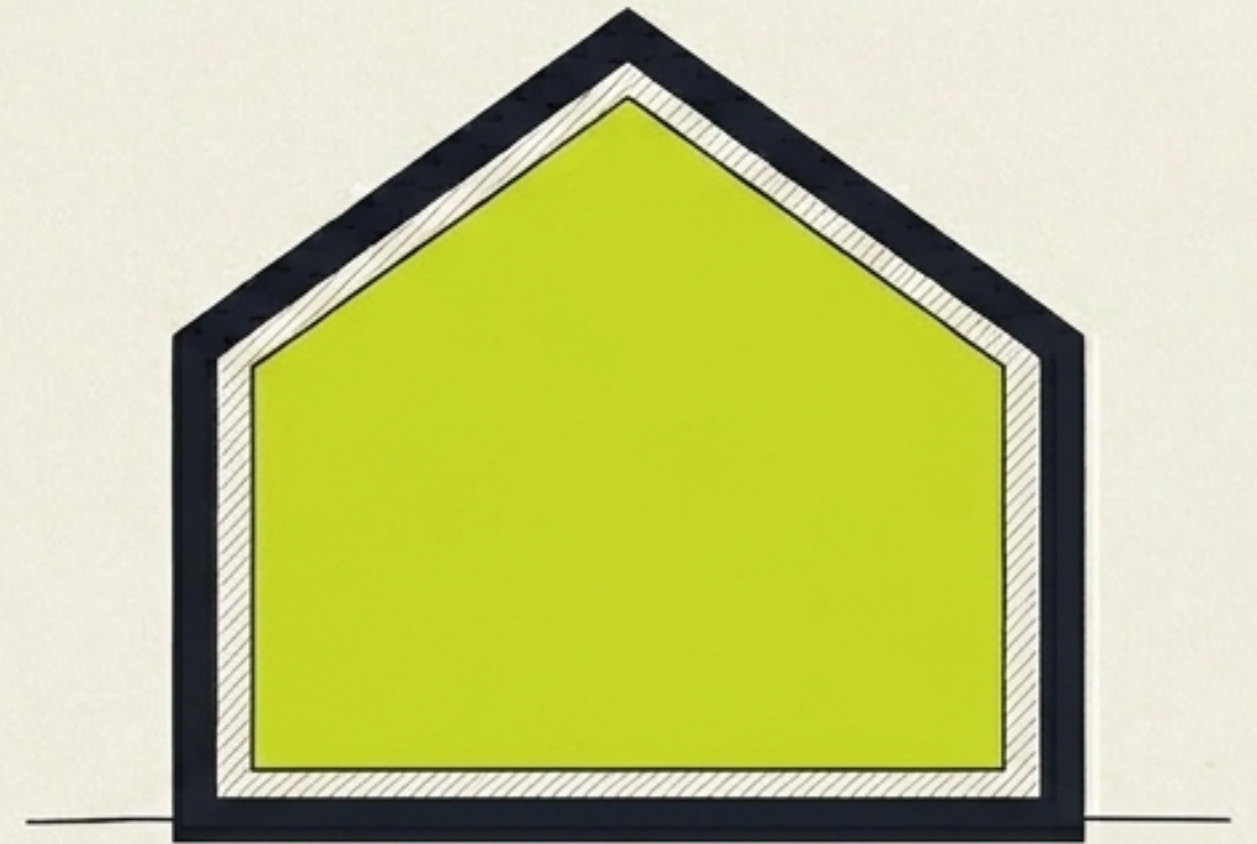


Building Science as Elegant Design.

True comfort is invisible. A Certified Passive House removes the reliance on active, centralized heating by mastering the building's envelope. By leveraging the thermodynamics of sunshine, shading, and rigorous structural integrity, a home can consume up to 90% less heating energy while maintaining a constant 20°C–25°C year-round.



The Traditional Envelope



The Ecotectural System

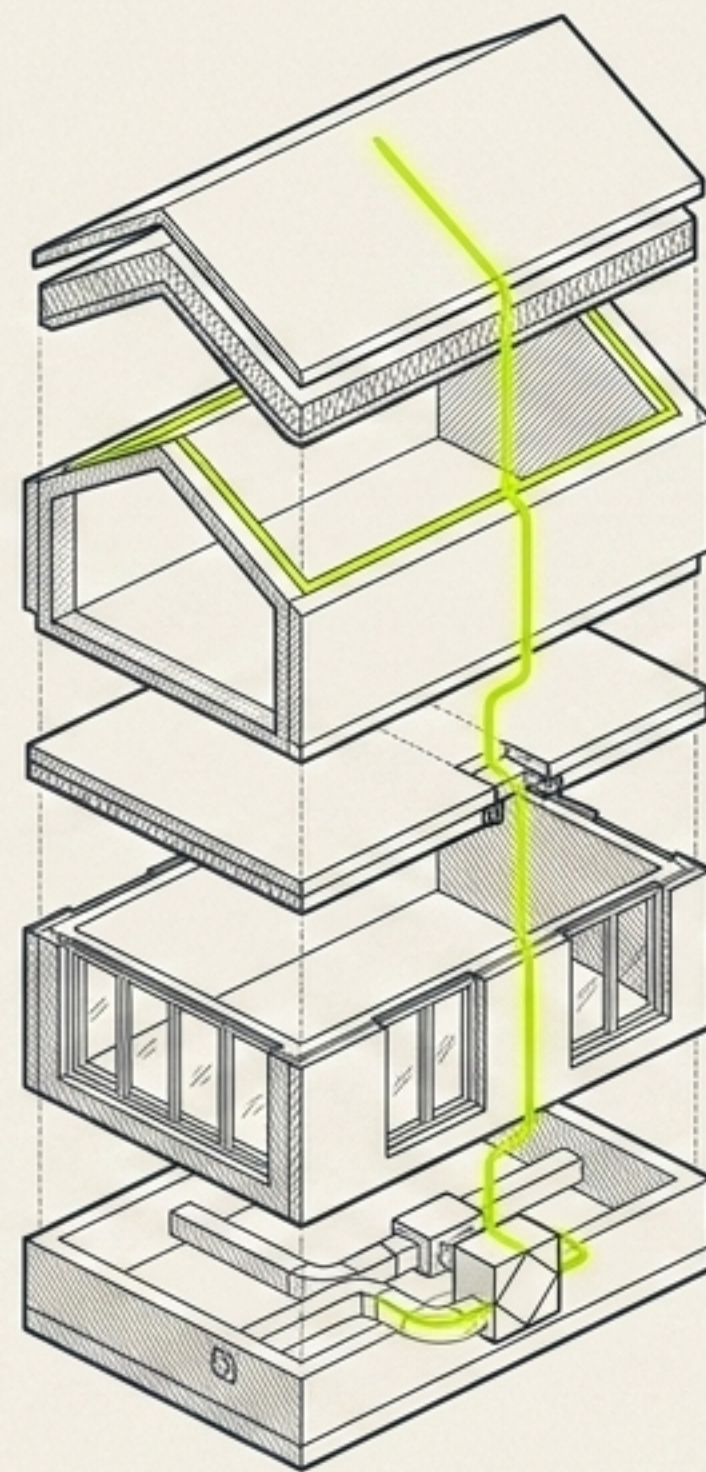
Passive House is not a checklist; it is an interconnected living system.

The Integrated Thermal Envelope

1. Super-Insulation:
The thermos flask boundary

2. Airtightness:
The unbroken internal seal

3. Thermal-Bridge-Free:
The isolated junctions



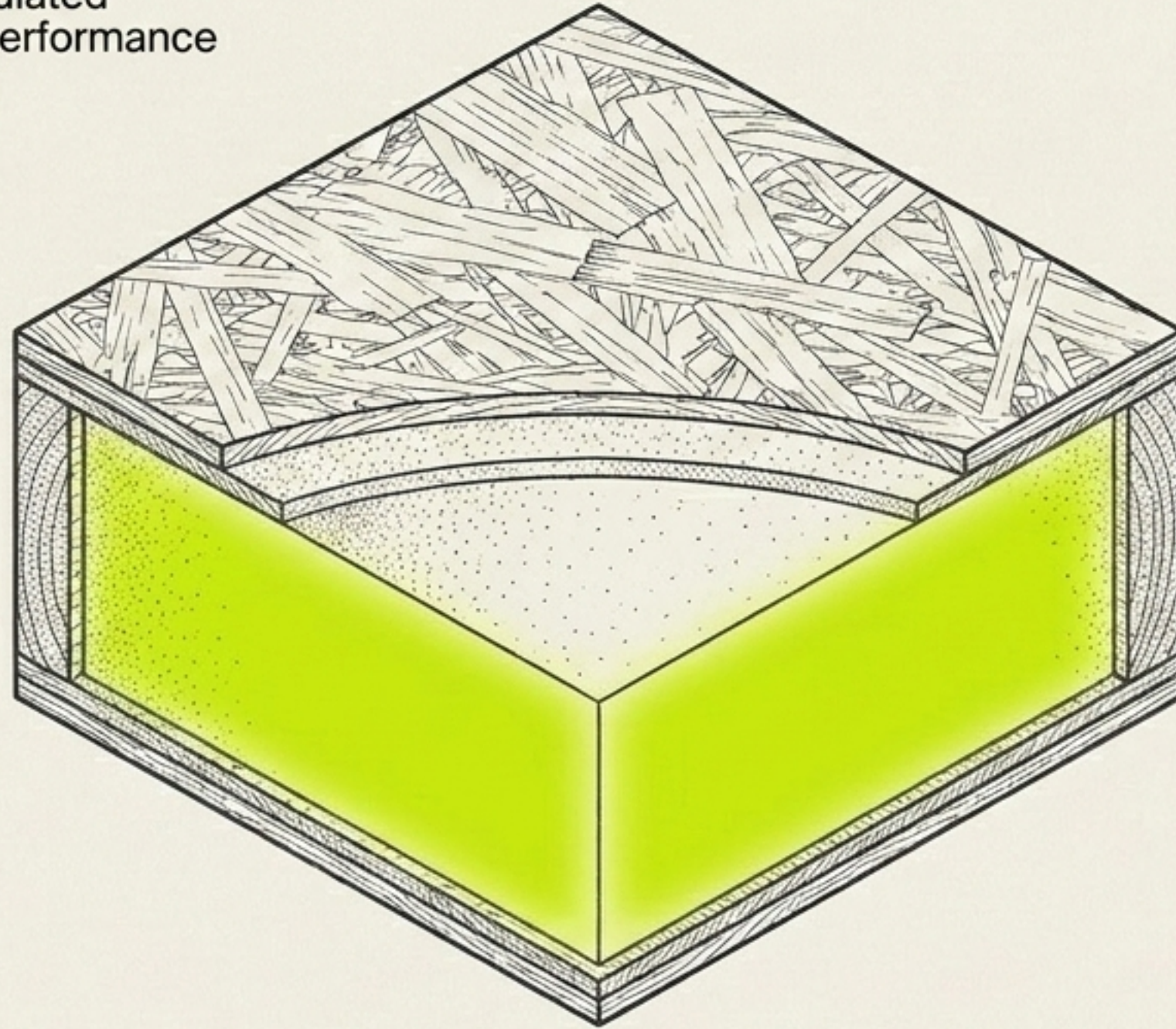
4. High-Performance Glazing:
The shielded apertures

5. MVHR:
The respiratory system

Five principles acting as interconnected organs of a single, highly calibrated machine.

01 / Continuous Super-Insulation.

Standard timber framing creates hollow walls that interrupt insulation every 600mm. We utilize Structural Insulated Panels (SIPs) — a solid, continuous core of high-performance insulation locked between structural boards.

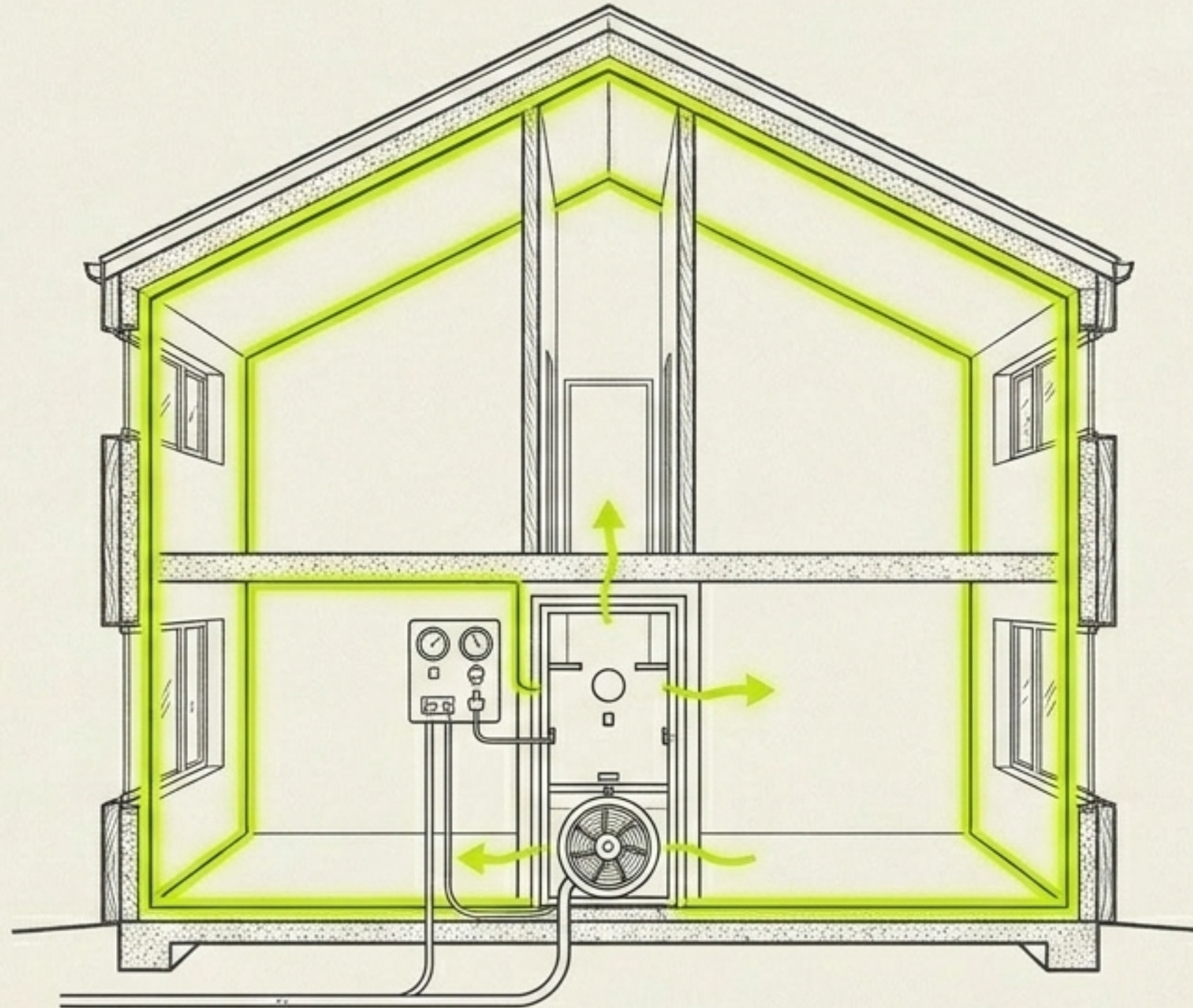


This methodology effectively wraps the home in an unbroken thermal blanket, mimicking the physics of a thermos flask.

Heat generated inside stays inside.

02 / Unbroken Airtightness.

Drafts are the enemy of thermal control and moisture management. By carefully detailing every junction and utilizing advanced membranes, we eliminate uncontrolled air leakage.

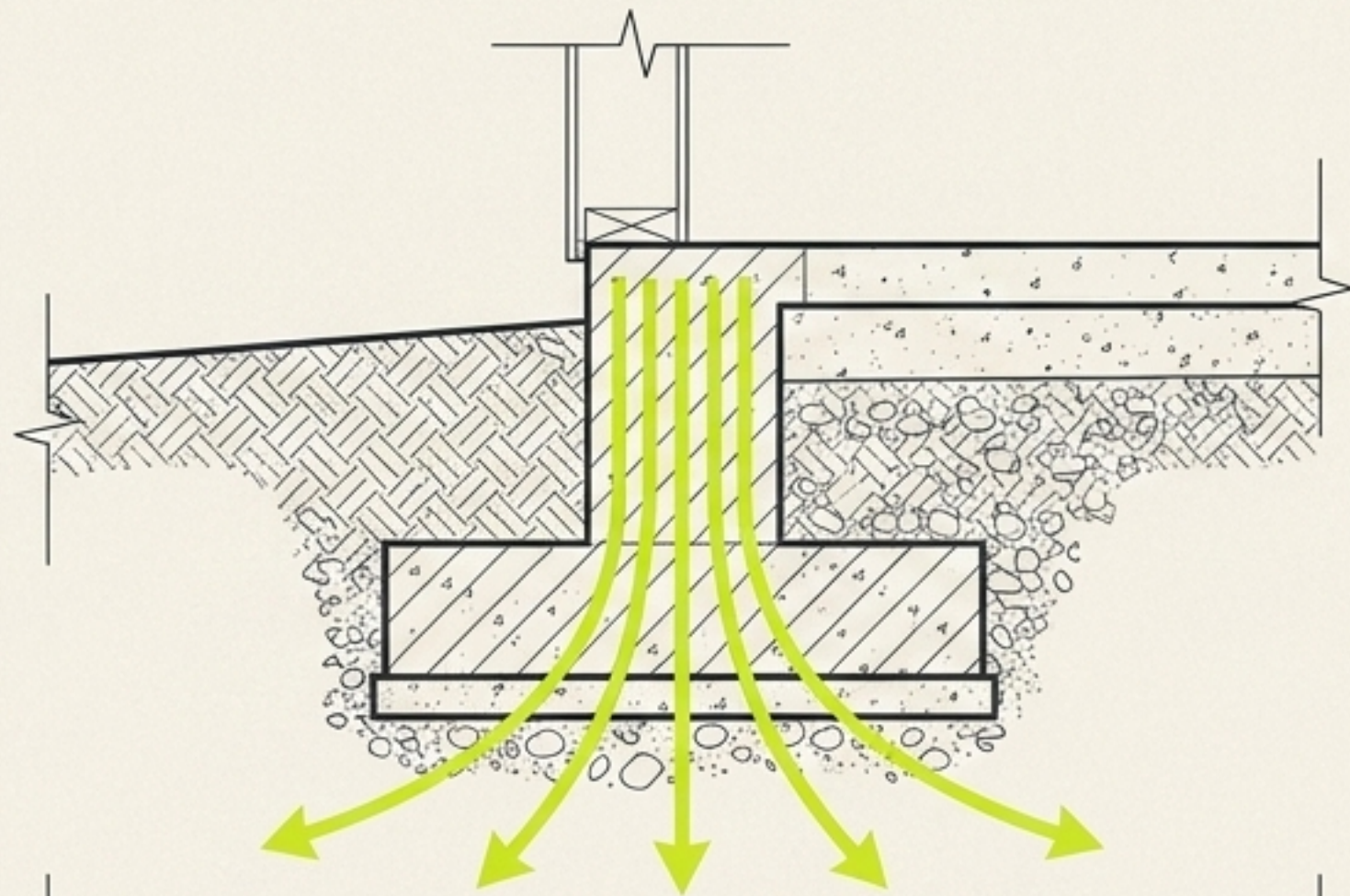


0.6 ACH50

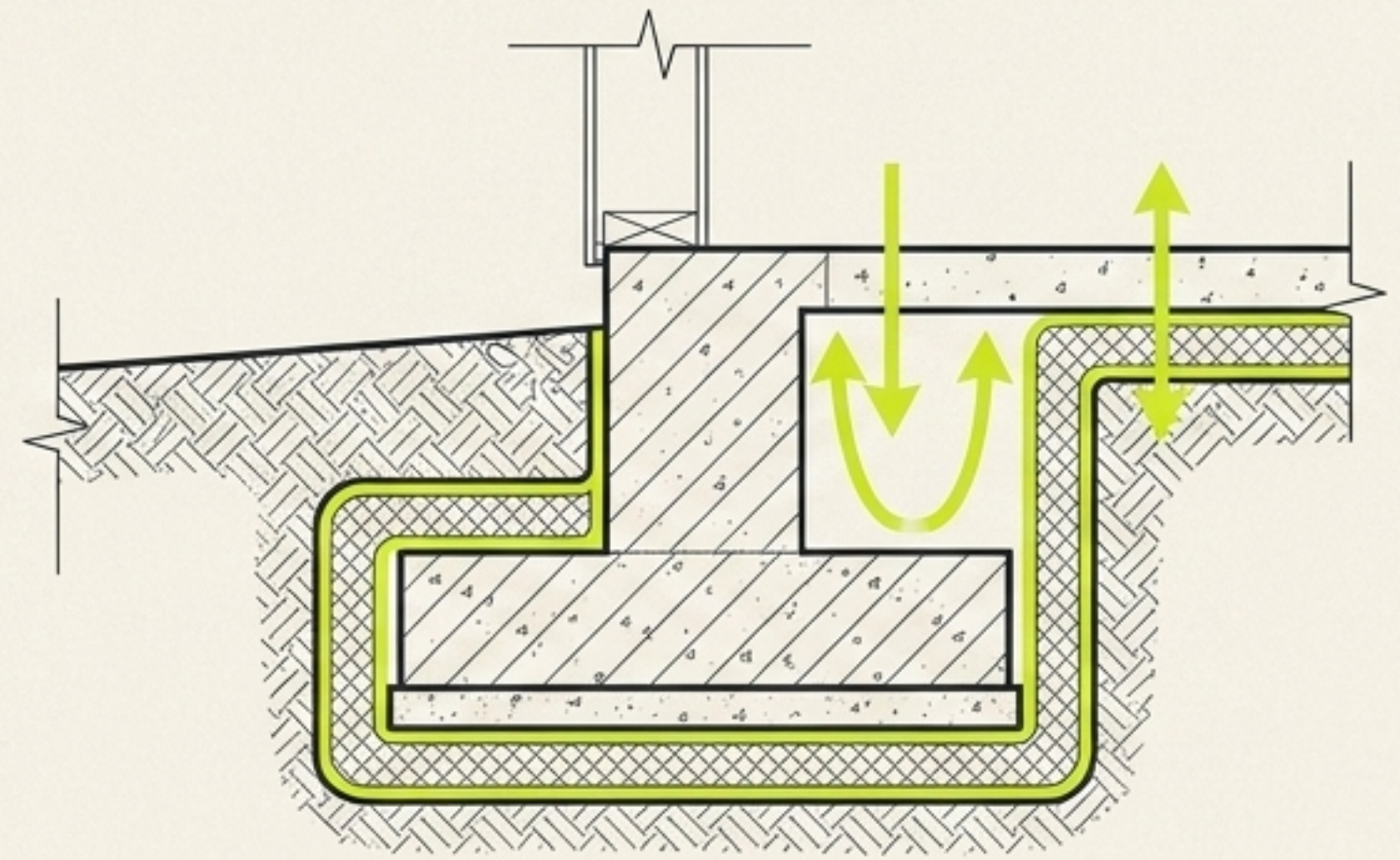
A Certified Passive House must achieve an airtightness of 0.6 Air Changes per Hour at 50 Pascals of pressure. The typical New Zealand home leaks exponentially more air, pulling in damp winter chill and exhausting expensive heating.

03 / Thermal-Bridge-Free Design.

A thermal bridge is a structural pathway where heat easily conducts out of the building. Concrete is a highly conductive material. By totally wrapping our foundations and critical junctions in high-compression insulation, we sever the pathway. The heat is contained.

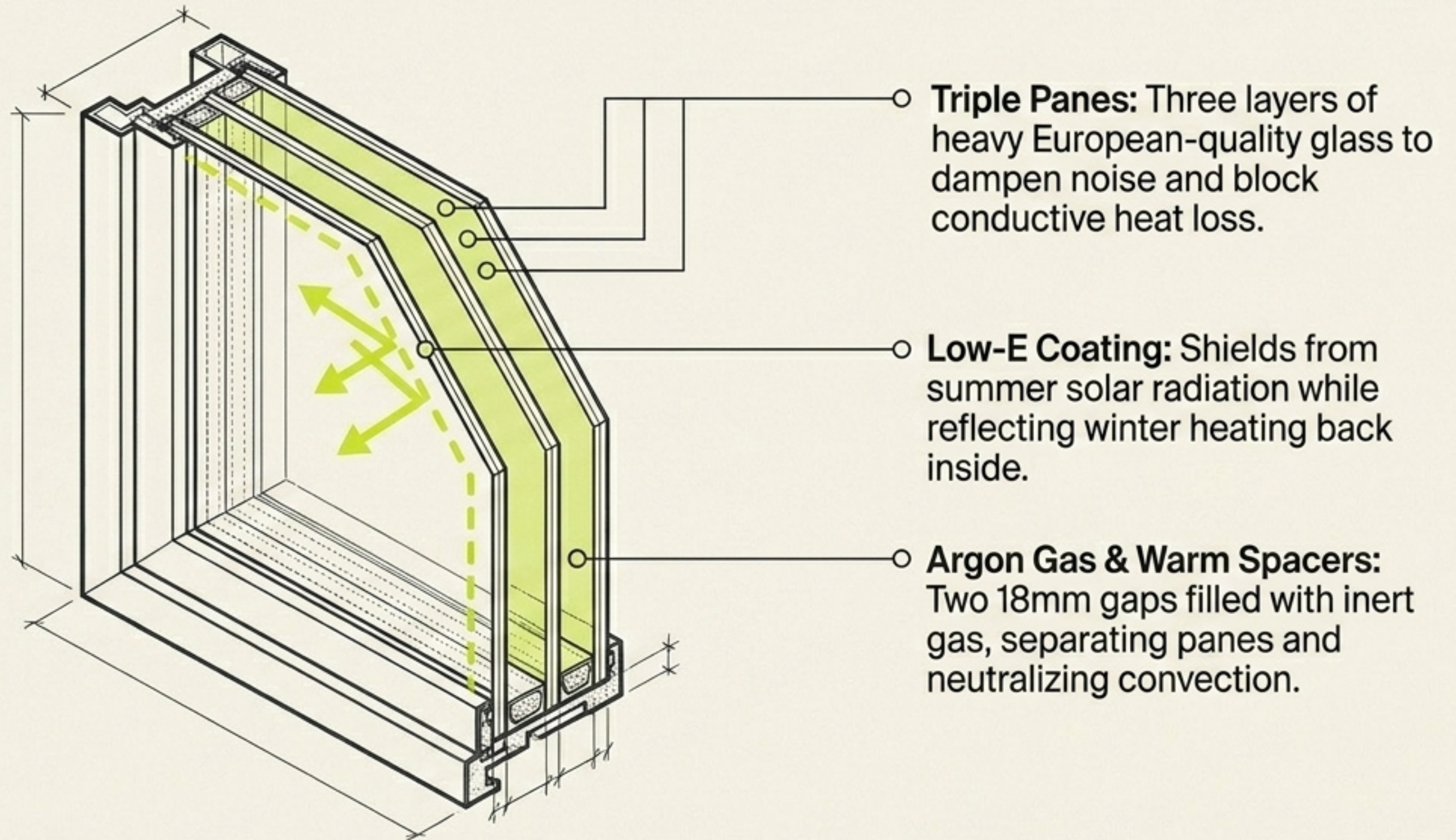


Conductive Heat Loss



Complete Thermal Isolation

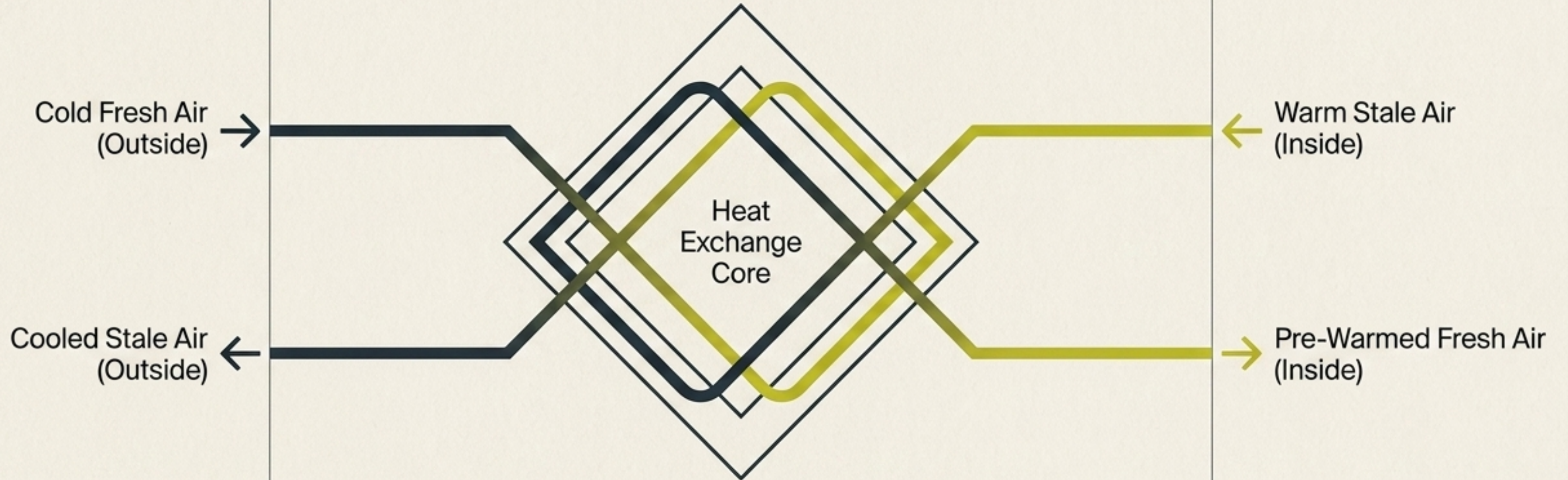
04 / High-Performance Glazing.



The Glazing Performance Matrix.

Metric	Single	Double (Code)	Triple (Passivhaus)
Thermal Resistance (R-Value)	R0.2	R1.1	R2.0 (81% Increase)
Condensation Risk	Guaranteed	Moderate	Near Zero
Noise Reduction	Poor	Moderate	Up to 80% Dampening
Draft Potential	High	Frame-dependent	Zero (Recessed & Broken)

05 / Mechanical Ventilation (MVHR)



If an airtight house cannot breathe, it fails. The MVHR system is the respiratory organ of the home. It constantly extracts stale, moisture-heavy air from kitchens and bathrooms, using its thermal energy to pre-warm the filtered, fresh air being drawn in from outside.

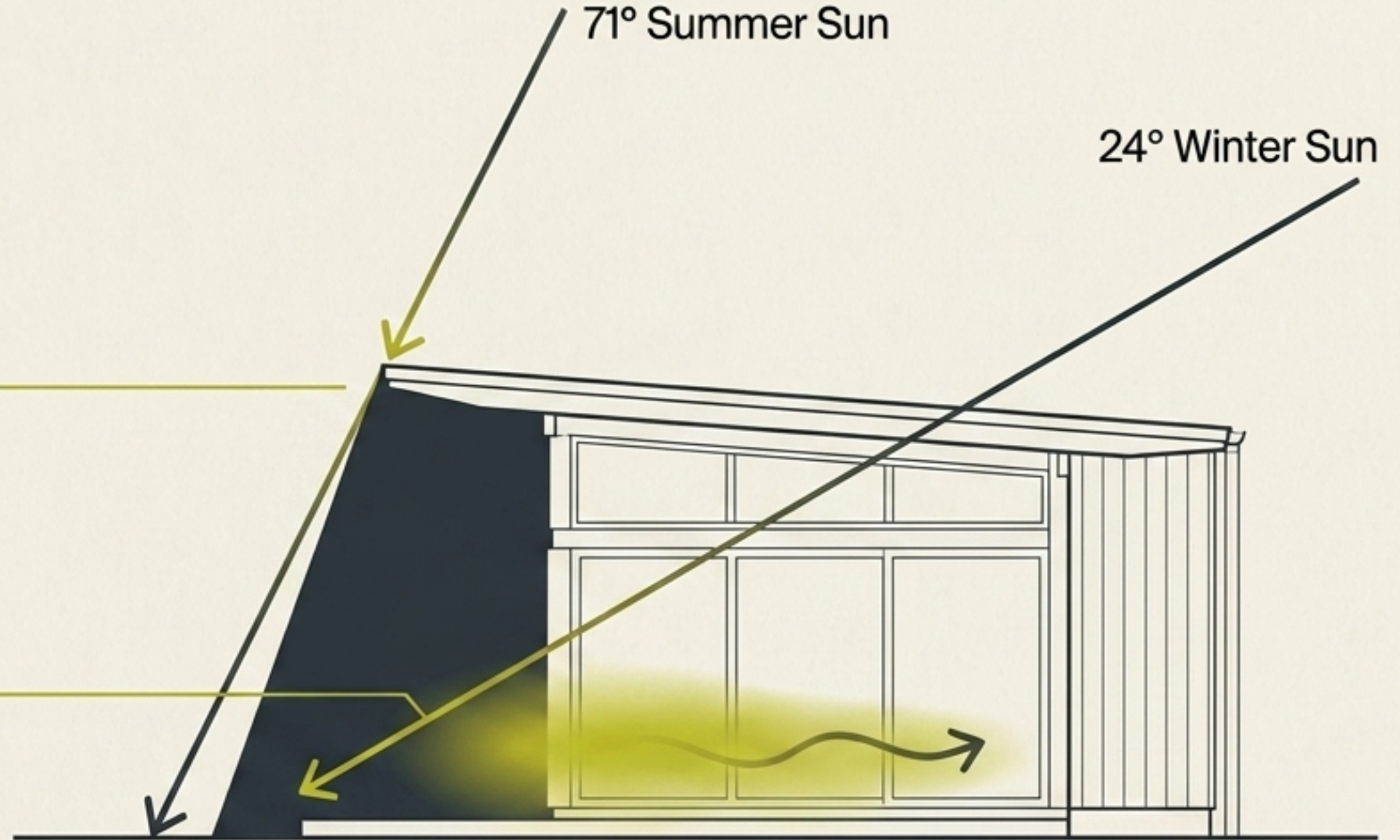
100% fresh air.
Zero drafts.
Near-zero heat loss.

Calibrating for Nelson Tasman.

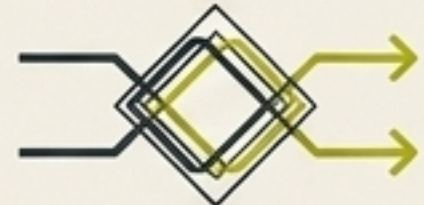
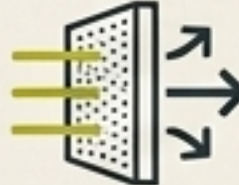
Nelson Tasman offers brilliant winter sunshine but punishing summer heat. A true high-performance home responds directly to its latitude.

Summer Shield: Deep, calculated eaves block high solar radiation to prevent overheating.

Winter Harvest: Low sun paths penetrate deep into living spaces to charge insulated thermal mass.



The Performance Delta

	Traditional NZ Code Home	Ecotectural Certified Passive House
Space Heating Demand	120+ kWh/m ² a	Max 15 kWh/m ² a 
Internal Winter Baseline	16°C (Often fluctuating)	20°C (Constant in every room) 
Airtightness (ACH50)	~3.0 - 5.0 (Drafty)	≤ 0.6 (Draft-free) 
Ventilation Method	Manual window flushing	Continuous MVHR heat exchange 
Health Profile	High condensation & mould risk	Clinically dry, filtered air 

The Future of Living is Quiet, Warm, and Certain.

To build a Certified Passive House is to reject the compromise of the past. It is an investment in absolute comfort, structural longevity, and the invisible luxury of perfect building science.

ECOTECTORAL HOME BUILDERS
NELSON TASMAN, NEW ZEALAND

Certification dossier and architectural consultation available upon request.