

Homenz

SUSTAINABLE SINGLE FAMILY HOME



City of Phoenix

Marlene Imirzian & Associates Architects

Home^{nz} About

Home nz provides a new model for single family home construction in Phoenix: a modern home with open, flexible spaces designed to operate at near net-zero energy use.

KEY FEATURES

- 2,650 square feet
- Fits on a typical Phoenix 60' x 110' lot with assumed setback lines
- Design is orientation neutral; works in any lot orientation
- 3 bedrooms, 2 1/2 baths
- HERS score of 30
- HERS score of -4 with photovoltaic panels

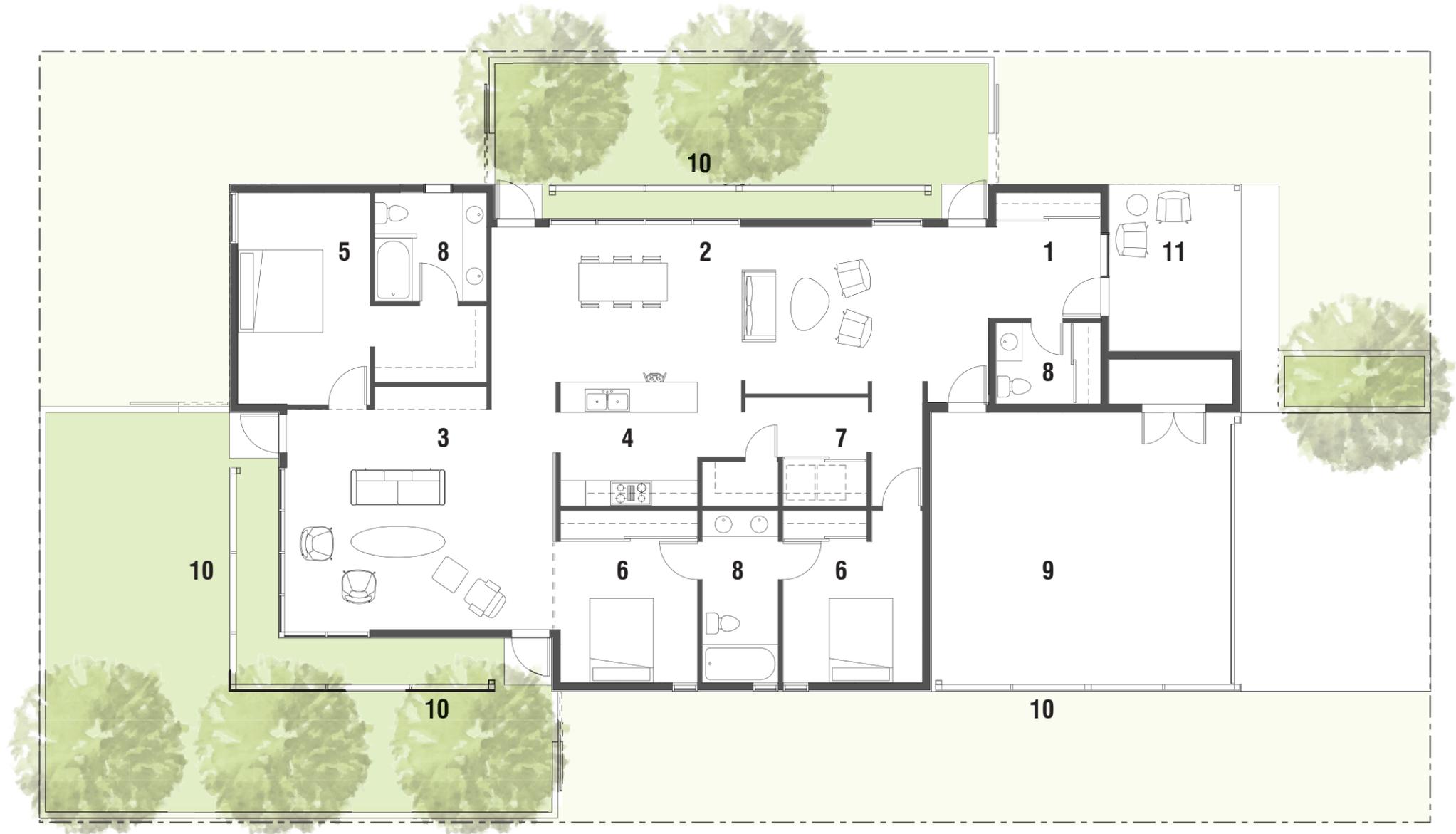
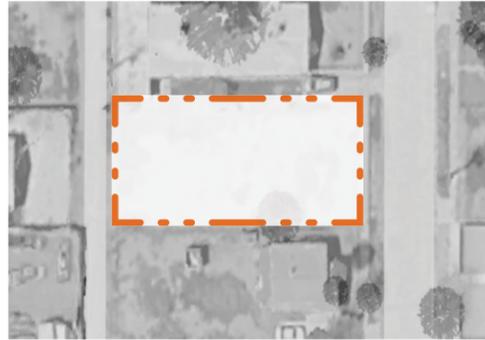
COST AND AFFORDABILITY

The cost of this sustainable home is within the range of the market for homes of this size. The contractor estimated cost below is based on early 2019 estimate and excludes land / site cost.

House (Excluding Land)	\$347,490.00
Solar Panel System	\$14,330.00
On-site Battery Storage	\$7,500.00



Home^{nz} Floor Plan

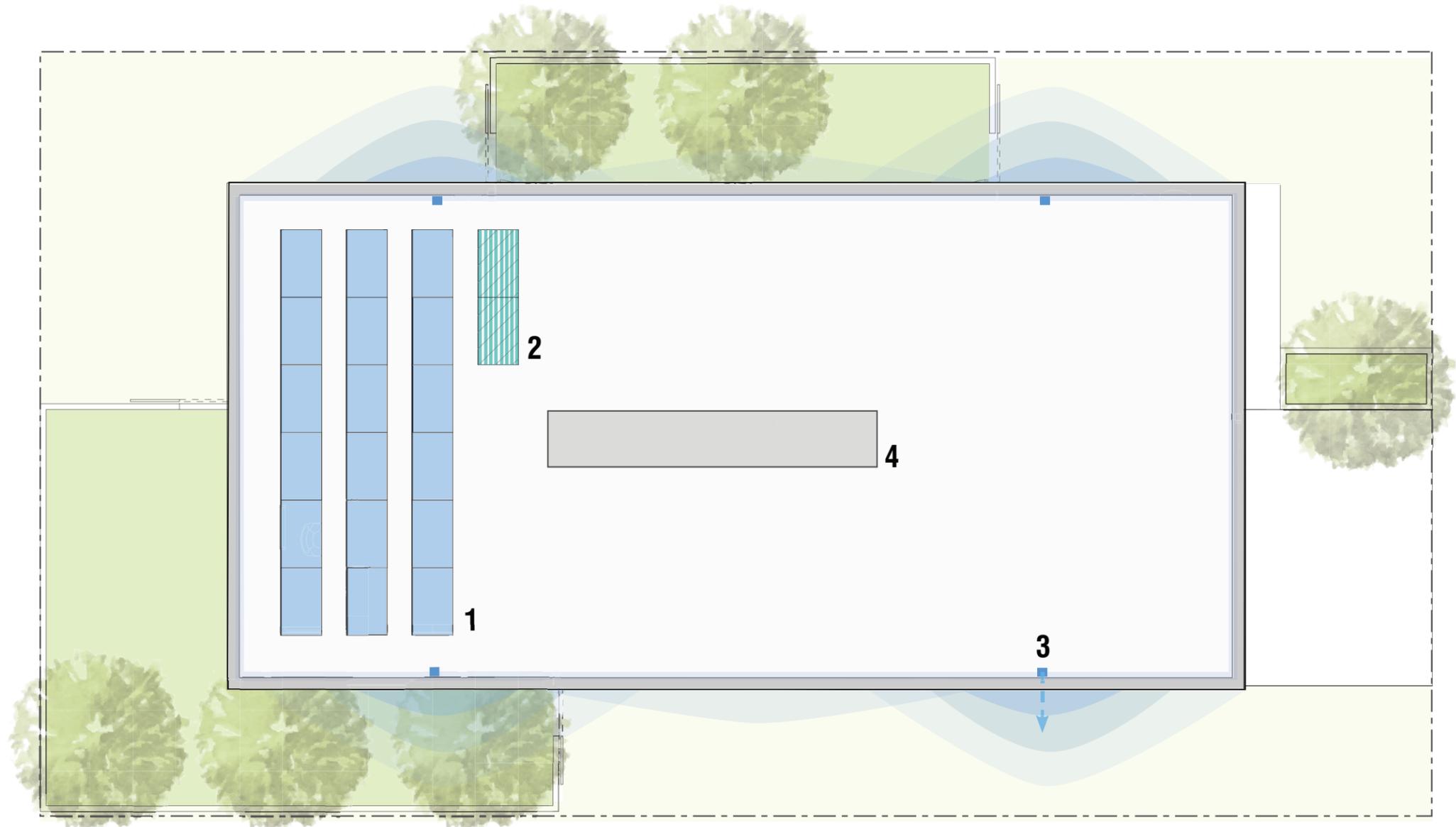


KEYNOTES

- 1 Entry Foyer
- 2 Family Room
- 3 Living Room
- 4 Kitchen
- 5 Master Bedroom
- 6 Bedroom
- 7 Laundry
- 8 Bathroom
- 9 Garage
- 10 Full Height Fabric Screen
- 11 Covered Porch



Home^{nz} Roof Plan



KEYNOTES

- 1 Photovoltaic Panels
- 2 Flat Plate Solar Collector for Water Heater
- 3 Low Point Scupper
- 4 Solar Chimney



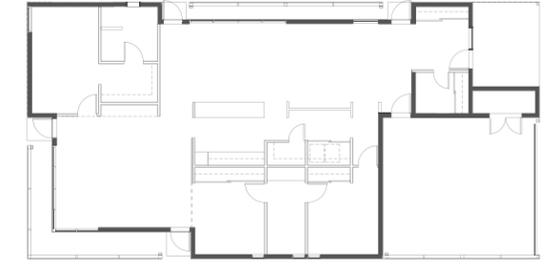
Home**nz** Front Perspective



Home**nz** Interior Perspective



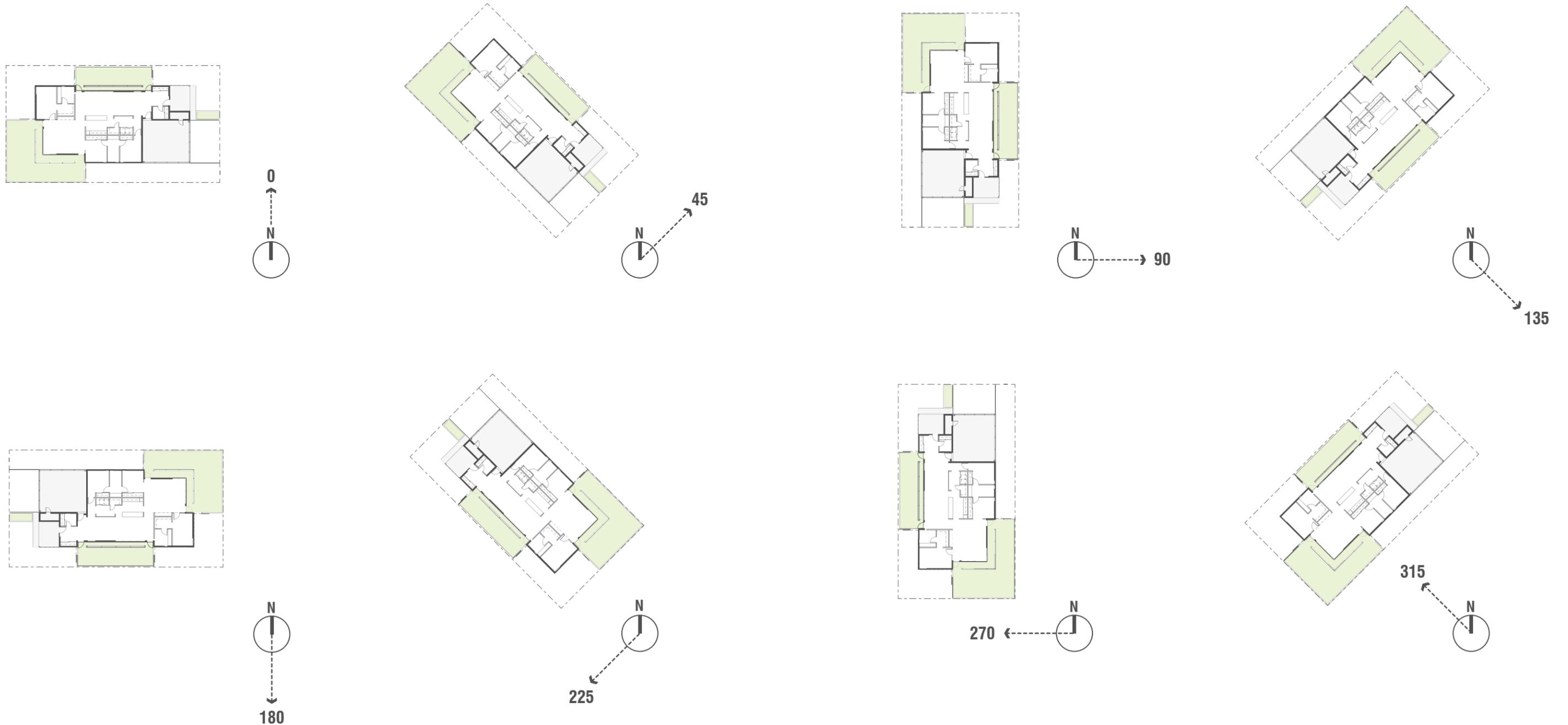
Home**nz** Elevation



Home nz Site Flexibility

FLEXIBILITY

Home nz is orientation flexible due to the shading elements integrated with window walls and covered entries. The exterior shading screens glazing from direct sun.

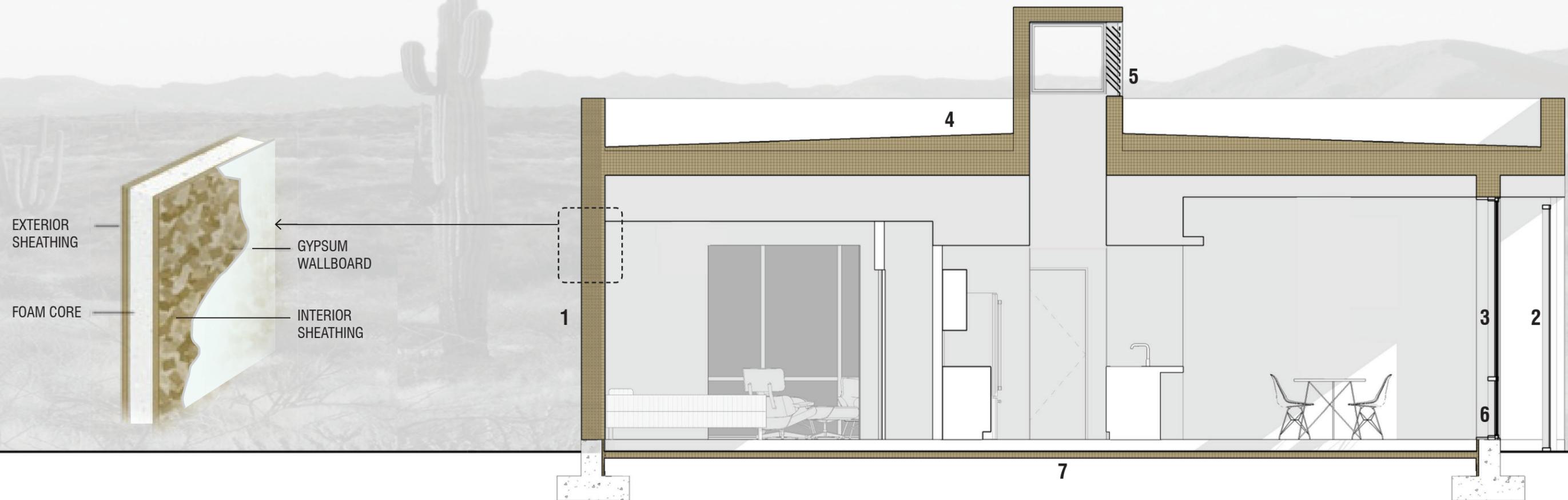


Home^{nz} Energy Efficient Envelope

STRUCTURAL INSULATED PANELS (SIP)

Structural insulated panels (SIP) provide structural support and continuous insulation. These panels form the building walls and roof, for a highly insulated exterior.

- 1 Insulated Wall Panel 9-1/4"
- 2 Fabric Screen
- 3 Glazing
- 4 Roofing Over 11-1/4" Insulated Roof Panel
- 5 Air Louver with Automated Damper
- 6 Operable Window
- 7 Underslab Insulation 3"



Home^{nz} Energy Efficient Envelope

DAYLIGHT AND SHADING

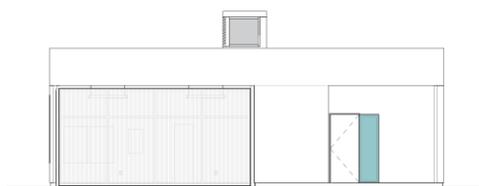
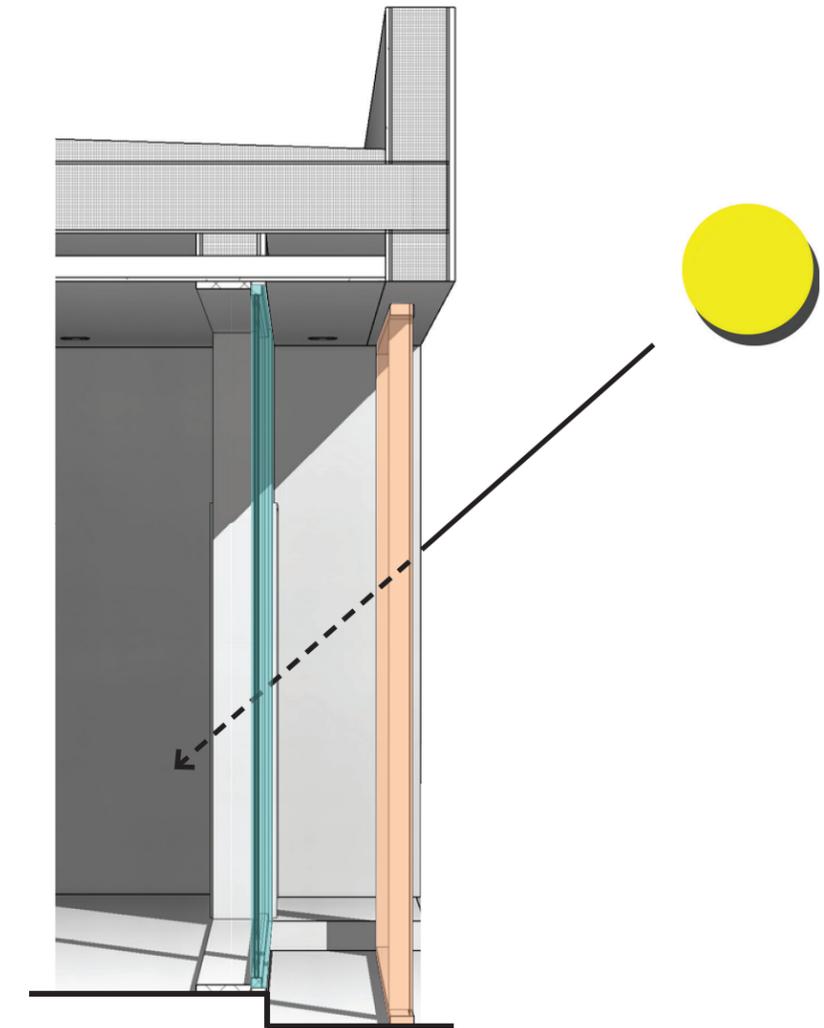
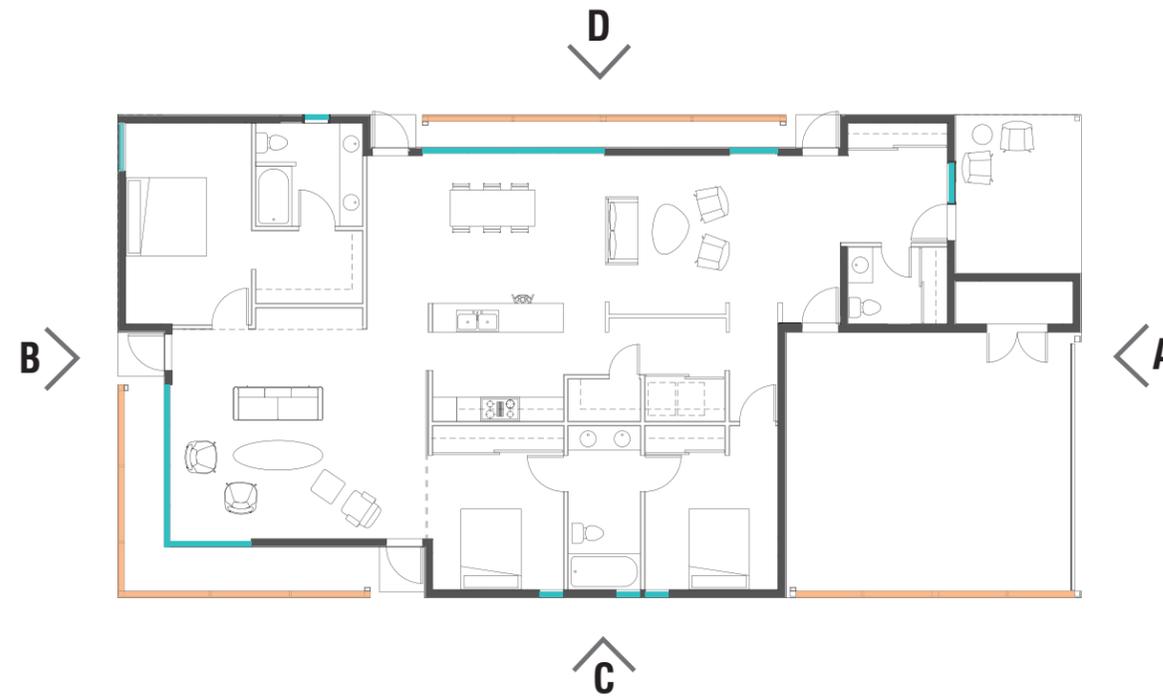
The house incorporates the use of highly efficient 'Solarban 70XL' glass to reduce heat transmittance. Operable windows are located throughout the home.

Protective fabric screens prevent **95%** of direct sunlight from reaching the glass, drastically reducing the solar heat gain.

12% of the building envelope is comprised of fully shaded glass

03% of the building envelope is exposed glass

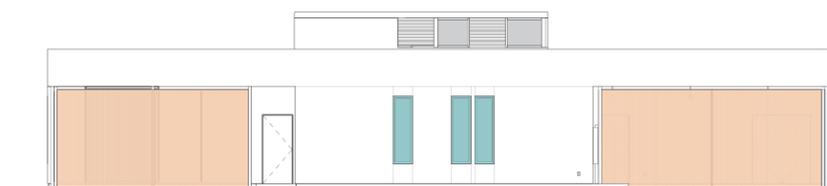
 Shade Screen
 Glass



ELEVATION A



ELEVATION B



ELEVATION C



ELEVATION D



Home^{nz} Efficient Systems

SMART HOME TECHNOLOGIES

- LED Light Fixtures
- Smart thermostat with home and away functions
- Energy efficient appliances
- Variable speed air conditioner limits start/ stop energy load, boosting efficiency by 800%

PASSIVE COOLING

The solar chimney provides natural convection of air throughout the house for ventilation and cooling. During the hottest days of the year, the house is naturally cooled without the use of compressors and inefficient mechanical equipment.

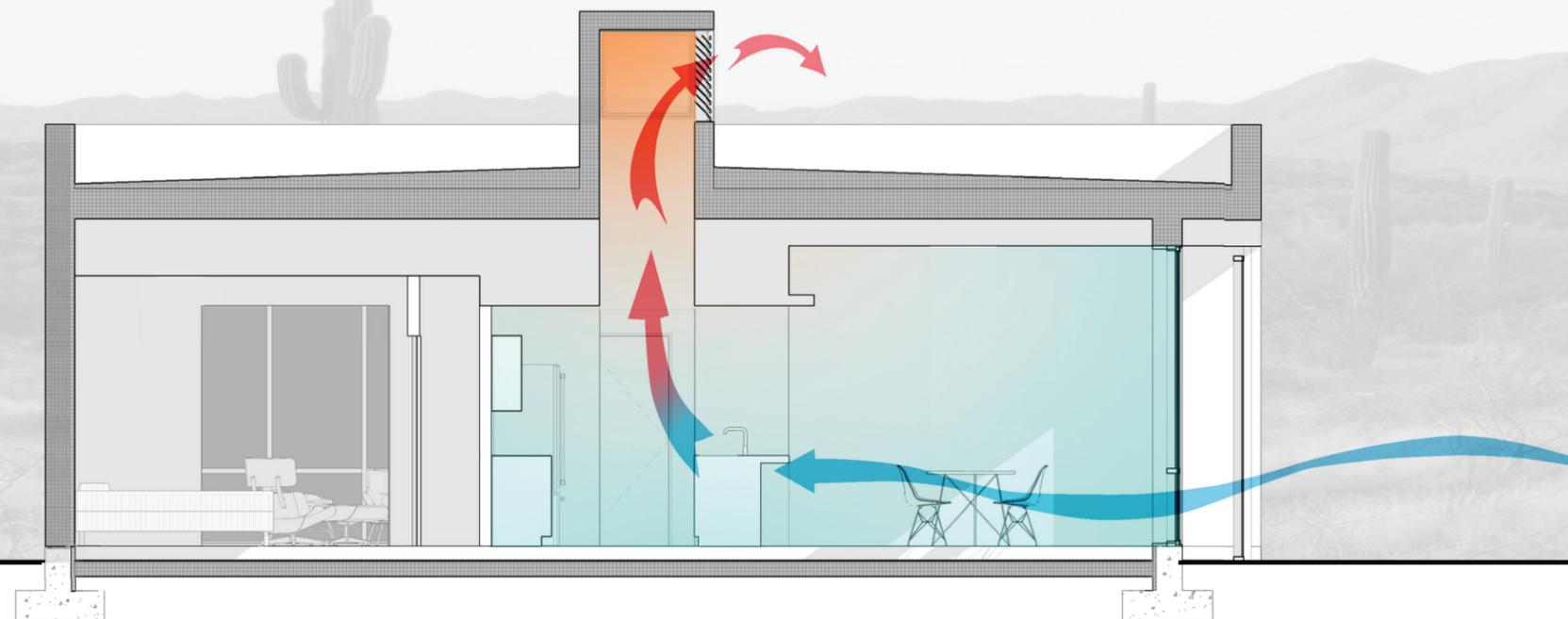
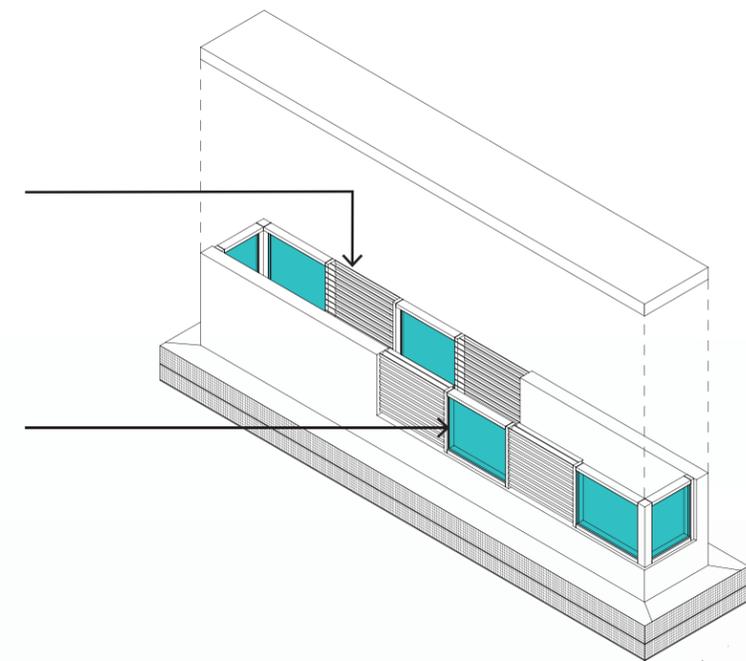
REDUCE WATER USE & STORM WATER MANAGEMENT

The perimeter of the roof is designed with four outlets where rain water can be directed to provide landscape irrigation and aid in plant sustainability. Any water that does not use the city resources will indirectly reduce the energy footprint required to treat and transport the water to the home.

SOLAR CHIMNEY

Damper automatically opens during temperate ambient conditions and closes during inclement weather and non-temperate conditions

Standard, unprotected glazing allows for air within the solar chimney to raise temperature and create convection currents



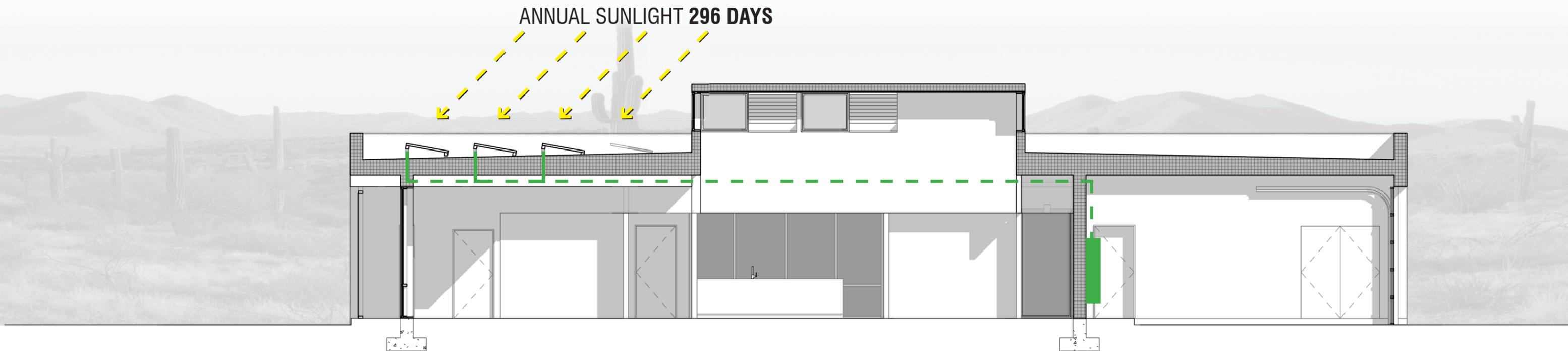
Home^{nz} Renewable Energy

SOLAR ENERGY

The house provides areas for photovoltaic panels on the roof. The planned panel layout provides for optimal performance and avoids all shadows cast from the solar chimney or parapet walls.

Because of the overall energy efficiency of the house, only 18 photovoltaic panels are required for power, and 2 panels for solar water heating.

The design incorporates provisions for a battery backup system to store the solar energy collected by the photovoltaic panels.



Home**nz** HERS Report

WHAT IS HERS?

The Home Energy Rating System (HERS) Index is the industry standard by which a home's energy efficiency is measured. It is also the nationally recognized system for predicting, determining, and calculating a home's energy performance.

Home nz ESTIMATED ENERGY USE WITHOUT SOLAR PANELS

	Use [MBtu]	Annual Cost
Heating	1.2	\$40
Cooling	6.7	\$228
Hot Water	1.2	\$41
Lights/ Appliances	19.1	\$647
Service Charges	-	\$158
Total	28.2	\$1,114

Home nz ESTIMATED ENERGY USE WITH SOLAR PANELS & BATTERY

	Use [MBtu]	Annual Cost
Heating	1.2	\$40
Cooling	6.7	\$228
Hot Water	1.2	\$41
Lights/ Appliances	19.1	\$647
Service Charges	-	\$158
Generation (Solar)	31.6	-\$956
Total	28.2	\$158

HERS® Index Score:

30

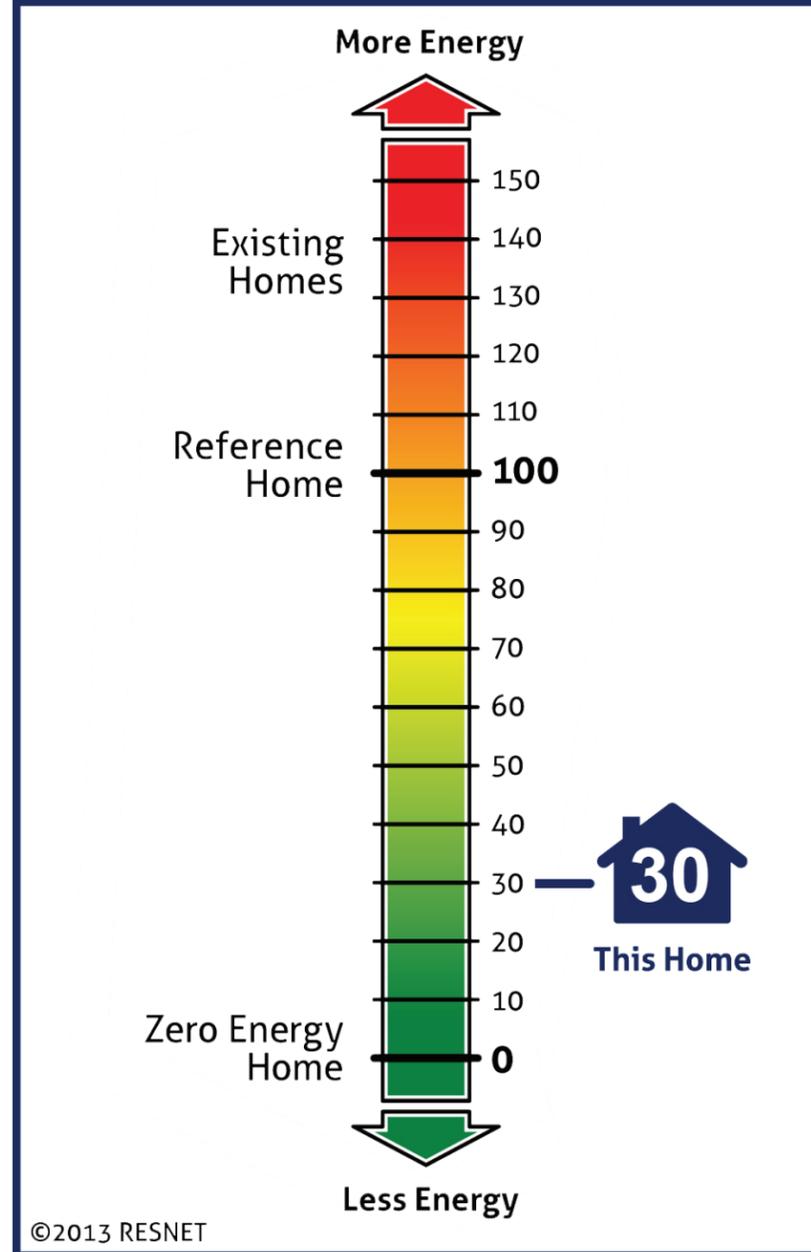
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings

\$2,275

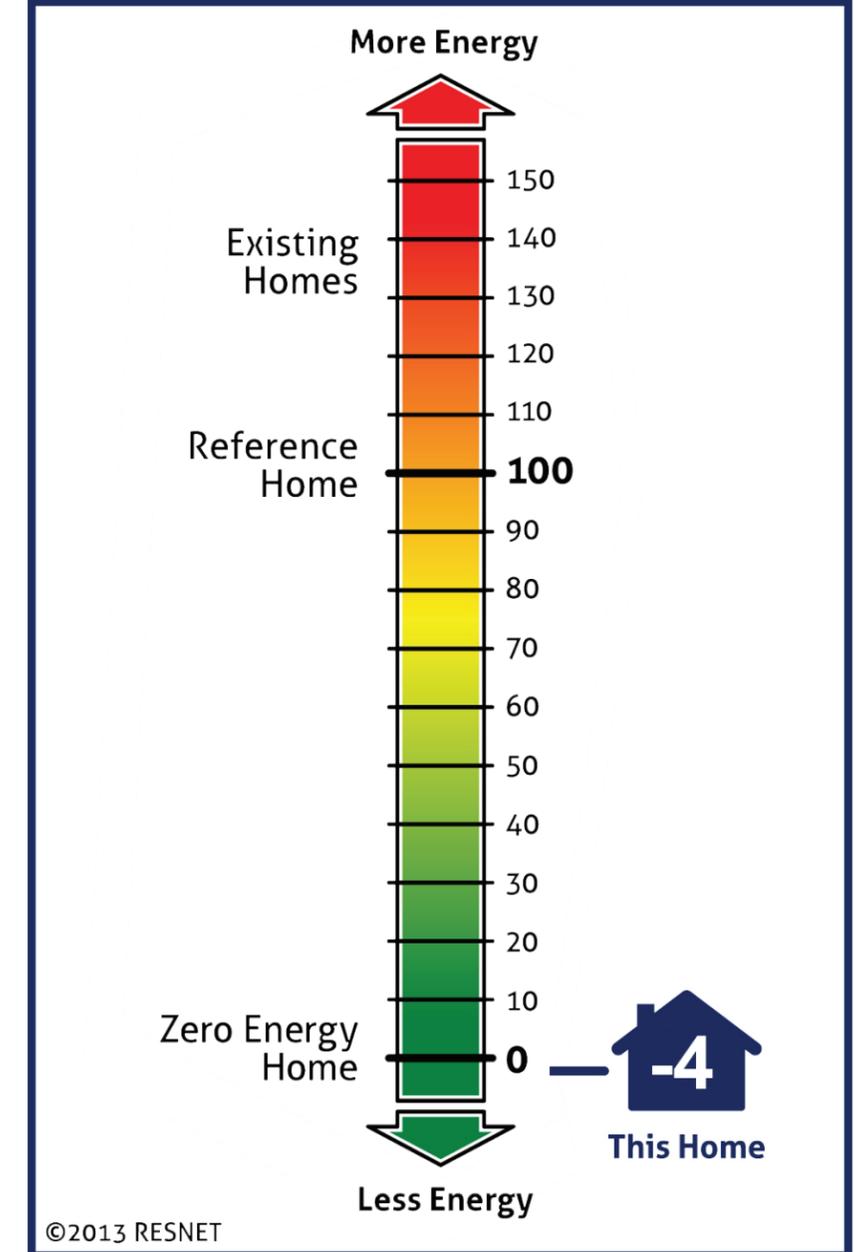
*Relative to an average U.S. home

HERS® Index



HERS SCORE WITHOUT SOLAR ENERGY GENERATION

HERS® Index



HERS SCORE WITH SOLAR ENERGY GENERATION



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SUSTAINABLE SINGLE FAMILY HOME

City of Phoenix Sustainable Home Design Plans

Architect: Marlene Imirzian & Associates Architects

Structural Engineer: SCL Consulting

MPE Engineer: Henderson Engineers

Construction Cost Estimate: Furcini Construction

HERS Evaluation: Desert Skies Energy Services

