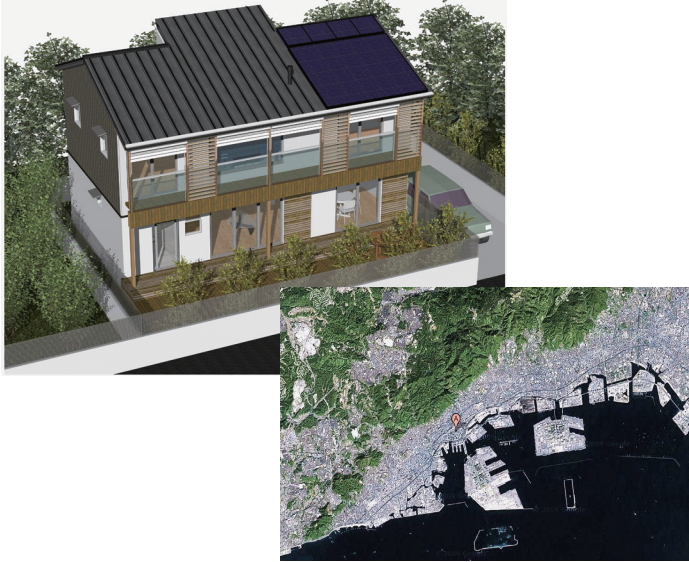


# Passive Solar Wooden House Tailored to Local Climate and Environment

Case Study for Kobe Design University

A passive solar house design to best take advantage of Kobe climate using scSTREAM can provide functionality, usability, and safety

## Forest in Kobe Eco-yaBAOBAB



## Purpose

Kobe area is sandwiched by Mt. Rokko in north and Osaka Bay in south. There is sea breeze from south in the morning, and land breeze from northeast in the evening. When they are weak or absent, north wind blows.

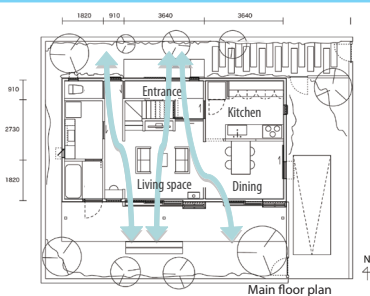
Passive solar design for Kobe housing is about the orientation of a building and the placement of windows to maximize the function of breezeway. It helps make alternative design patterns of house plan for seasons and local life scenes.

## Analysis model

### Taking advantage of natural energy Elements of passive solar design

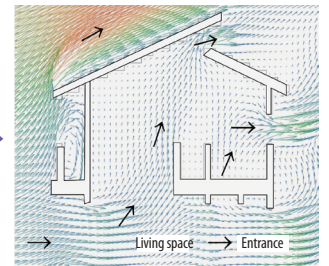
- a: A north entrance
  - b: Windows at ceiling height
  - c: Living space with windows for the north-south breezeway
  - d: Interior finish with natural materials and high thermal insulation performance
  - e: Double-layer window
- 

Open house plan designed to create the north-south breezeway in the house



Model plan A  
Main floor : 54.6 m<sup>2</sup>  
2nd floor : 45.9 m<sup>2</sup>

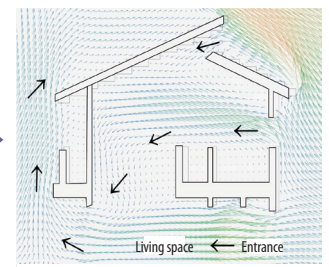
## Analysis result



2m/s: Velocity of the middle of living space

### -Living space with breeze-

Well positioned windows at floor and ceiling height maximize the flow of natural breezes to further enhance the passive design used in a house. It will provide a living space that feels like an outdoor porch, yet it is inside.



2m/s: Velocity of the middle of living space

### -House design to achieve summer comfort through natural breeze-

After sunset, entrance and windows capture cool land breezes from north and provide a cool living space. Shading is effective in reducing the amount of heat transfer to the house through windows, walls, and slabs during the hottest times of the day.

## Customer Comments

“Natural passive house tailored to local climate” is an innovative architectural design based on the traditional techniques suited to the local climate. It is the true environmentally-friendly house in that it provides comfort from natural winds and lights. It is built of natural materials and offer superior comfort. scSTREAM enables the designer to examine the ventilation design on passive house for Kobe climate.