

# Comfort In Any Climate

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## Simple Survival Earthship App



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**We must become more aware of how we use our energy.**

### Comfort: Earthships maintain comfortable temperatures in any climate.

The planet Earth is a thermally stabilizing mass that delivers temperature without wires or pipes. The sun is a nuclear power plant that also delivers without wires or pipes.

Different climates around the world require different designs for the home to interact with these two sources of temperature.

The outer few feet of the earth heats up and cools off in response to surface weather. However, deeper in the earth, about four feet and beyond, the temperature is more constant (around 58 degrees). Here, the earth can be used to both cool and stabilize temperature if the home is appropriately designed.

Earthships are thermal mass homes first, passive solar homes second. Therefore, the layout and design of the Earthship can be completely customized to look like any conventional home, and still be sustainable.

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The “generic” earthship designs are what works the best, both in terms of economics and energy efficiency.

Because of the way Earthships interact with the sun and the earth, little to no fossil fuels are required to maintain a comfortable, stable temperature in any climate.

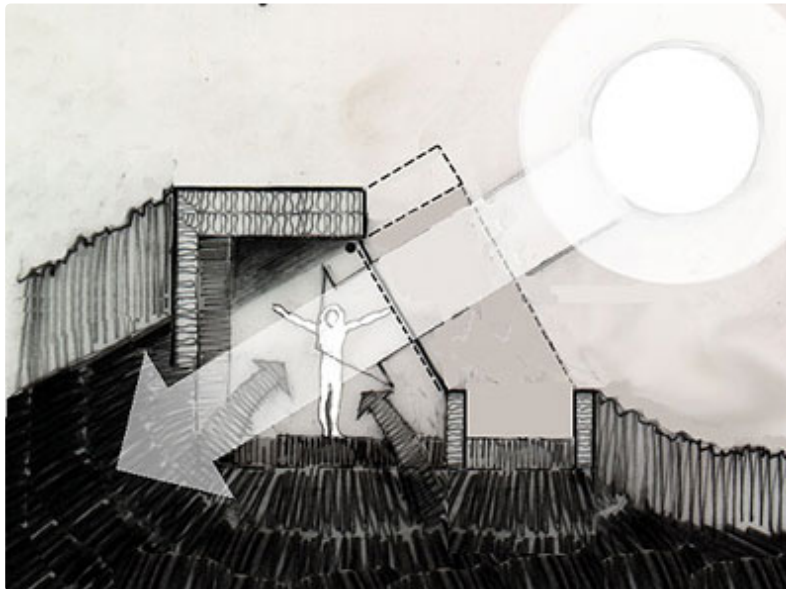
## **Comfort In Any Climate**

**Comfort in Any Climate Book. \$16.** Breaks important sustainable design concepts down into clear, easily understood elements: thermal mass, insulation, heating, cooling, and ventilation.

### **Warmth**

If you want heat, you admit the sun. The sun heats the mass, the mass stores the heat and the insulation won't let it escape.

The more mass, the more storage capacity. When there is no sun, the heat stored in the mass radiates into the space, for heat travels to the cooler direction.



### **Coolness**

If you want coolness, you admit the cooler earth temperature and block the sun. The cool mass of the earth connects with the mass of the shelter, is absorbed into the shelter mass and leaks into the living space. This is like hooking a big battery (the earth) up to a smaller battery (the shelter). The thermal mass of both the earth and shelter is a storage battery for temperature.

- > E.V.E. Workshop – Colombia May 2017
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- > Simple Ways to Reduce Waste at Home
- > Michael Reynolds addresses the Flint, MI water crisis

## Authors \_\_\_\_\_

Michael Reynolds

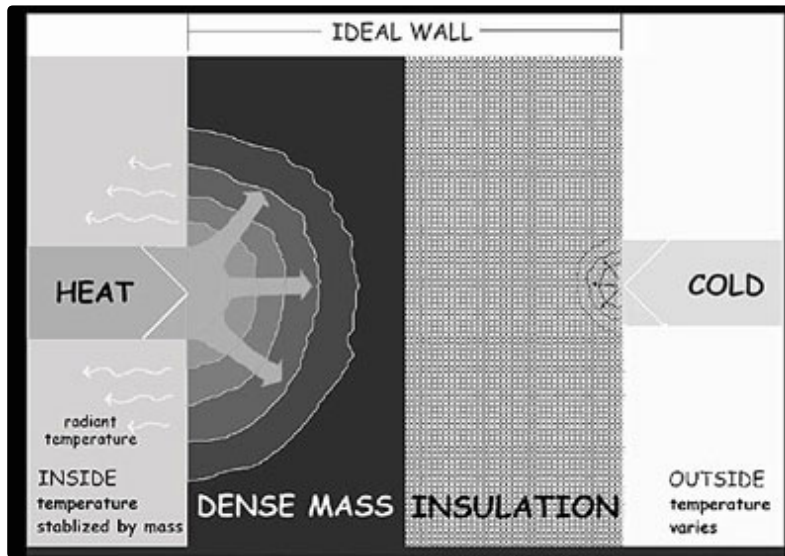


“ You were correct we were quite comfortable even on the -20'sF day.  
 — British Columbia, Canada Earthship. ”

### Insulation & Thermal Mass

In recent years humans have recognized the fact that insulation can help keep temperature in a shelter. Insulation, however, neither collects nor stores temperature. It simply blocks the passage of temperature from inside to out and visa versa.

Good insulation has millions of tiny air spaces. The presence of air spaces tends to slow up the movement of temperature by causing it to pass from air space to air



space as opposed to moving easily through unobstructed dense mass.

Dense mass both collects and stores temperature like a jar holds marbles. Examples of dense mass are stone, water, compacted earth, or concrete. There is a major difference between mass and insulation and this difference is not very clearly understood. Dense means no voids or air spaces. The more dense the mass the more temperature it holds. This density actually acts as a conduit for temperature.

The people made shelter by assembling pieces one at a time. They put pieces together around themselves not upon themselves. Soon they had created shelter around themselves. They were in shelter. The people also found happiness by manifesting it piece at a time. They manifest happiness all around themselves not for themselves. Soon they had created happiness all around themselves. They were in happiness. Both shelter and happiness can be achieved by focusing outside of self.

We are simply adapting our needs to the already existing activities of the planet.

Why pipe water long distances from a centralized community water system, or from an expensive well that needs significant electrical power, depletes aquifers and lowers the water table, when water falls from the sky?



Why have a corporate or political “middle man” between us and our energy needs? our vessel (home) must be designed to sail with the forces that exist beyond human control and exploitation.

An understanding of mechanical systems for most humans is limited to what is within reach of their fingertips. It is understood that when you flip a switch on the wall, a light comes on. when you turn on the faucet, hot water comes out. When you pull the handle on the toilet, it flushes. Little though is given to where the electricity comes from or what kind of nuclear waste was produced to generate it. how many of us even know where the power plant is that supplies our power. Few people ever wonder which water table is depleted to

bring them water and what chemicals have been added to it. Where does the sewage go after it is flushed and which rivers and lakes are polluted by it?

Humans need comfortable temperatures, light, electricity, hot water, food, sewage treatment, etc. These necessities are all available within the framework of a certain “rhythm” in the Earthship. The more we are able to align our priorities and needs with the prevailing rhythms of the planet, the easier and less expensive (both in terms of economics and ecology) they will be to obtain.

If our lifestyles can conform more to the patterns of the planet than to our socioeconomic system, we can reduce the stress on both ourselves and the planet. This is easier said than done due to the “reality” and the “gravity” of mortgage payments, utility bills and the generally high cost of eating and living. Most of us have no choice. We have to be places at certain times looking certain ways in order to make the money needed to make those payments. However, many people have built Earthships themselves and ended up with little to no mortgage payment. They also have little or no utility bills and their ability to grow food year-round inside the Earthship has greatly affected what they have to spend on packaged, processed foods.

The condition of our planet tells us we must now begin to take responsibility for what happens beyond the reach of our fingertips. We must begin to reconsider the source of these utilities, our access to them, and how we dispose of the waste produced. The mechanical systems of the Earthship confront these issues directly. We call this direct living. Source, access and destination are all contained within the Earthship, within the reach of our fingertips. There is no mystery involved in Earthship electricity. There is no unknown source of water. There is no magical black hole that sucks up all our sewage. Instead, we work in harmony with the earth to deal with these issues – taking what it has to give us directly and giving back what it wants to receive. With this harmony ringing in our minds we evolve the Earthship Systems.

## About Earthship Biotecture

Earthship Biotecture is based in Taos, New Mexico, and has been providing humans with the tools necessary to sustain themselves and the planet for over 45 years. By using **carbon-zero technology in building plans** and integrating all systems with **food production**, our designs are the first truly sustainable, independent models on

the market today. We able to construct comfortable units in any climate made primarily out of natural and recycled materials.

Earthship **construction drawings** are designed to meet standard building code requirements so you can get a permit no matter where you are. **Earthship Biotecture is beyond LEED Architecture. Earthships are green buildings that meet standard building codes.** EarthshipBiotecture is based on the work of principal architect, **Michael Reynolds**. (see: media resume)

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## Contact Us

### Main Office and Nightly Rentals

[reception@earthship.com](mailto:reception@earthship.com)

+1 (575) 751-0462

Visitor Center +1 (575) 613-4409

### Mailing Address:

P.O. Box 1041

Taos, NM 87571

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