

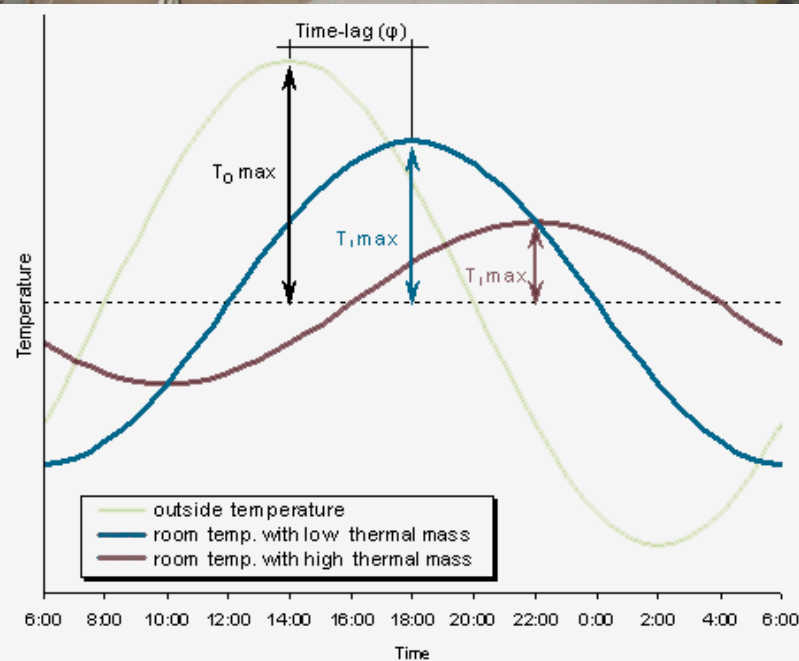
passive solar [thermal mass]



Thermal mass is a term given to a building material that can absorb and retain large amounts of thermal energy, or heat. Without thermal mass a building cannot be effectively heated by solar radiation. Concrete, brick, tile and other masonry materials offer a higher thermal mass than traditional materials like drywall, carpet and plywood.

Thermal Slabs - our Energy “Battery”

Each floor of the parkland net-zero is comprised of a 2.5” concrete slab. In total, 1,300 cubic feet (38 m³) of fly-ash concrete make up the high thermal storage of the house [dry weight of thermal mass in the floors is 20,000 lbs]. By using the floors of the home as the thermal mass we were able to most economically achieve the desired solar storage.



“A slab thickness of 2 inches (5 cm) is sufficient to absorb and release heat on a daily basis. Some passive solar designers are after a rapid response or quick warm-up of the slab on a daily basis. Thin, 2 to 3 inch (5–7.6 cm) slabs lend themselves to this. Compared to thicker slabs, they are less expensive, and can be poured over wood-framed floor systems, designed to handle the added weight of the concrete.” (*Home Power #90 • August / September 2002*)

Floor Finish

We chose dark earth tones as finish color for the main floor and basement so the slabs would absorb more of the sun's energy. Covering the floor with carpet or other materials would insulate the floor and reduce its ability to absorb and release heat. Efforts were made to reduce the sheen of the floor in order to minimize reflection of energy off of the thermal slab.

Other Mass

Concrete countertops were chosen primarily for their durability and “earthy looks”. A secondary feature on the countertops is the added thermal mass to the building. Masonry around the fireplace absorbs energy in the living room and helps in minimizing room temperature fluctuations.

